

The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XII. No. 308

MAY 9, 1925

Prepaid Annual Subscription :
United Kingdom, £1.1.0; Abroad, £1.6.0.

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NOTICES.—All communications relating to editorial matters should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

The prepaid subscription to THE CHEMICAL AGE is 21s. per annum for the United Kingdom, and 26s. abroad. Cheques, Money Orders and Postal Orders should be made payable to Benn Brothers, Ltd.

Editorial and General Offices—8, Bouverie St., London, E.C.4.
Telegrams: "Allangas, Fleet, London." Telephone: City 9852 (6 lines).

Synthetic Ammonia Problems

THE visit to London last week of Dr. Luigi Casale was an event of interest to British chemists, for owing to his work in the field of nitrogen fixation the name of Casale, like those of Haber, Claude, and others, has passed into international use. His visit, which only lasted two or three days, had, however, more than a merely personal interest. It was quite frankly concerned with the business of the Casale Ammonia Co. and with the stimulation of British interest in that concern. He was accompanied by Mons. Bouchayer, the president of the company, and other directors. Dr. J. F. Crowley, who acted as their host and gave a dinner in their honour, is known not only as an engineer but as one closely associated with the late Dr. Harker, organiser of the Nitrogen Products Committee. He was able to introduce them to a company which included many not usually seen at the ordinary chemical gathering and which also omitted many whom one has grown accustomed to see wherever chemical science or chemical industry is represented. In this respect it was an interesting departure from the domestic chemical tradition.

In his statement from the chair Dr. Crowley paid tribute to Dr. Casale and his work, described some of the characteristics of his process, and frankly advocated a definite British interest in its international development. Other short speeches followed, but we confess

that if they had stopped at a certain point we should have been left a little in the air as to the ultimate result. Just at the end, however, some points made by Dr. G. C. Clayton, M.P. (who was present in the place of Sir Max Muspratt), suggested a possible line of development. While recognising that the Haber plant at Billingham for the production of synthetic ammonia is working satisfactorily, Dr. Clayton pointed out that it is but one plant, and that a serious danger may possibly arise from that fact in case of air raids during war. (It is rather ominous how quickly we have returned to the habit of discussing such matters in terms of war.) He suggested the need of alternative sources of nitrogen supply located in various parts of the country, and pointed out the suitability from this point of view of the Casale process, since it is distinctively a small unit process. Originally it was worked on a scale of about three tons of ammonia a day, but the model plant of to-day is the one capable of about 7½ tons, representing roughly a quadrupled output in the form of sulphate. In the Casale process the operating pressure is about 600 atmospheres, as compared with 200 in the Haber process and 900–1,000 in that of Claude. The hydrogen is usually obtained electrolytically, and the engineering problems are regarded as relatively simple. Dr. Clayton's references to the advantage of several units on different sites instead of one or a few large installations on one site and the favourable terms in which he spoke of Dr. Casale's method naturally set one speculating. Dr. Clayton not only represented at the function the head of the United Alkali Co., but is himself a director, with high technical qualifications, of that concern. At the annual meeting Sir Max Muspratt indicated the possibility of a much more direct participation in the dyestuffs industry. Now Dr. Clayton points to developments in the synthetic ammonia field, which would fall easily within the resources of the company with which he is associated. Naturally there is room for speculation, but that is as far as one can go for the moment.

There is one commercial or economic aspect of the nitrogen fixation industry which producers of ammonium sulphate by other methods and from other sources will be compelled seriously to consider before long. That is the effect on prices of the enormously increasing output. Billingham is understood to be producing about 130 tons of sulphate a day, and the natural tendency would be to increase rather than diminish production. Now there is the suggestion of additional plants of another type. Inevitably, it seems to us, nitrogen production must go on expanding for some time to come not only here but throughout the world. One result of increased production is lower prices. Another is the need of developing consumption so that it may keep pace with output.

These problems, we fancy, are already engaging the attention of those in the nitrogen industry whose business it is to look ahead.

Catalytic Production of Methyl Alcohol

FOR some time now there has been a lack of precise information as to the progress which is being made in the development of processes designed for the catalytic production of methyl alcohol. Some four years ago it appeared as though we were on the eve of important commercial applications of the process in this country, and some of our readers will remember the promising information which we were able to give in connection with the Calvert method in 1921. Since then, however, things have moved slowly, and the water gas process does not seem to have been given the commercial encouragement which, judging from results in France and Germany, it appears to warrant. The recently published particulars of the work of Patart in France leave the impression that the production of synthetic methyl alcohol from hydrogen and carbon monoxide is a relatively simple operation as compared with the production of synthetic ammonia, mainly because it appears to be unnecessary to employ pure gases, while there seems to be a remarkable similarity between the plant used for the two processes. The last factor is important owing to the engineering knowledge which has been accumulated in connection with ammonia synthesis and which can be applied to the newer process.

In the Patart process the only raw materials employed are hydrogen and carbon monoxide, and so far as concentration is concerned it has been found that the composition of the gaseous mixture can be varied within wide limits, and can even consist of equal volumes of the two gases, so long as hydrogen is supplied to the system equally as fast as it is utilised in the formation of the methyl alcohol. In so far as the details of operation are concerned M. Patart has collected from the experiments that he has been conducting in a small industrial plant at Asnieres some extremely valuable information. For instance, he has found that inert gases (such as nitrogen, methane and carbon dioxide) do not prevent the reaction although they retard it, while the reaction chamber must be externally, and not internally, heated, as in the latter case carbon and methane are produced. The selection of catalysts seems to have given rise to some perplexity. Powdered copper would appear to show the most desirable characteristics, but its use was apparently followed by the formation of carbon, the best results being ultimately given by the oxides of vanadium, chromium and zinc, admixed with copper. It is well known, of course, that the Badische concern has been developing the synthetic production of methyl alcohol for the past two years, and although the present output of their plant at Merseburg is not actually known it was said to be producing from 10 to 20 tons a day at the end of 1923. M. Patart, however, seems to have carried the process well ahead of the German principles, for he experiences no poisoning of the catalyst in his employment of water gas which has only been partly purified. This in itself should entail a good deal of economy in the way of working costs.

Death of Lord Leverhulme

As we go to press the announcement is made that Lord Leverhulme died early on Thursday morning at his Hampstead home. His illness was short, as he would have wished it to be. He not only kept the faith but he kept the pace right up to the end of his wonderful career. He began as a Bolton grocer boy; he ended as a prince of industry. The world organisation he built up will remain his greatest memorial, and while he was its inspirer it was so organised as to live after him. For in his lifetime he collected other minds about him and made them almost a part of himself and his work. No one recognised more fully the value of science in industry, and his wise and liberal employment of chemical science played a fundamental part in his revolution of the soap industry.

Great business man as Lord Leverhulme was, he was an equally great citizen. He had fine social sympathies and a love of the humanities which softened and liberalised the hard individualism which formed the atmosphere of his early struggles, and he lived to see in that model industrial community at Port Sunlight the realisation of his early dreams of contented co-operative and happily-enviored labour. Throughout his strenuous life, immersed in vast financial and material dealings, he never lost his grip of ideals, and little as he valued denominational aspects of religion he followed a broad and definite Christian faith. His Messel Lecture of last year may well stand as his *Apologia*. Those who chose him for that duty did more than they probably realised at the moment. They gave him the opportunity, of which he took a fine advantage, of confessing and summing up the moral principles on which his life-work was built. His Messel Lecture, a revelation at the time to all who heard it, acquires a new interest and dignity now as a final public testament of his personal faith.

Starting at the Wrong End

IN our issue of a fortnight ago, dealing especially with laboratory apparatus and furnishings, the point was emphasised again and again that the laboratory or research worker of to-day is no longer dependent upon products of foreign origin but has a complete choice in the output of British firms. A casual reference, however, to two non-English types of apparatus has irritated a correspondent into a wholesale charge against English professors and other users of laboratories that they prefer foreign ware as a matter of course and do not take the trouble to find out what is produced in this country. This attitude of mind seems to us to be very much the attitude that Sir Alfred Mond had in view when he complained that the British manufacturer does not sell his goods but merely expects somebody to buy them. As we have repeatedly pointed out, the reputation which Germany succeeded in obtaining both for German chemicals and German apparatus was not solely the result of the superior quality of German goods; it was very largely due to the fact that German salesmanship was so competently organised that the purchase of German goods was attended with less difficulty than the choice of almost any other.

It is, of course, regrettable that even in University laboratories there should linger the belief that their requirements cannot be provided satisfactorily out of the products of our own countrymen, but we fear it is useless expecting the professor or any other research worker to spend his time in searching about for what is produced in this country, when the manufacturers of competing countries relieve him of all trouble in this respect by keeping him completely informed. The real remedy lies not in abusing professors or other people, but in putting British goods on the market in the attractive and convenient way that the British maker has hitherto allowed his chief rival to do, very much to his own disadvantage.

British Chemicals

THE Official Directory of the Association of British Chemical Manufacturers for 1925, published by Ernest Benn, Ltd., at 10s. 6d., under the title of *British Chemicals: Their Manufacturers and Uses*, is perhaps the most convincing single piece of evidence of the remarkable progress made in chemical production in this country since pre-war days. The new form of the directory is a distinct improvement in many ways on the old; additional information is given, including the industrial uses of the various chemicals manufactured, and the matter is much more conveniently arranged for reference. The volume is intended to give potential purchasers in all parts of the world information as to the products manufactured by members of the Association. It is printed in English and in five other languages, and where intending purchasers have any difficulty in obtaining a particular article they are at liberty to communicate with the Association, which undertakes to place the inquiry before all members likely to be in a position to supply what is required. The Association also undertakes to advise on all matters relating to the chemical trade, and inquirers are assured of the best expert and manufacturing opinion being obtained for their benefit. The directory finally removes the difficulty inquirers after British products have experienced in the past by supplying a list of the chemicals manufactured in this country, with the names of the actual makers.

Wembley, 1925

THE official opening of the British Empire Exhibition at Wembley for 1925 takes place to-day (Saturday). On the commercial side its scale will be considerably restricted as compared with last year, and neither in the Palace of Industry nor in the Palace of Engineering will there be the astonishing range of British products collected together in 1924. The Chemical Section, which attracted so much notice last year, will, however, be continued on an undiminished scale, and will occupy the same site. It is to be hoped that the enterprise of the chemical exhibitors and the chemical organisers will meet with a reward commensurate with their public spirit. Wembley is rather more of an experiment than it was the first year, and only actual experience can determine how far the degree of success attained in 1924 will be repeated. Our own impression is that public interest in Wembley is far from being

as keen or as general to-day as it was twelve months ago, and the Exhibition authorities seem to be doing about as much or as little to excite it as they did before. Fortunately, the Chemical Section is in competent chemical hands, and the fullest success that good organisation can attain is assured in advance.

B.D.C. Vat Colours

THE latest addition to the Colour Index of the British Dyestuffs Corporation is a volume relating to vat colours on cotton yarn (second edition). Since the issue of the previous edition several new colours have been added to the company's range, including Duranthrene Olive R, Duranthrene Olive 2 R, Duranthrene Red 5 G, Duranthrene Claret B 8720, and Duranthrene Golden Orange 2 R T. In addition seven Duranthrene and five Durindone dyes are now supplied in powder as well as in paste form. The vat colours classed in the Duranthrene series are derivatives of anthraquinone, while the Durindone brands are indigoid dyestuffs. The Duranthrene colours are especially suitable for the dyeing of vegetable fibres in all stages of manufacture, and are distinguished for excellent fastness properties. The Durindone colours are applicable to vegetable fibres in much the same way as the other series. Though, generally speaking, inferior to Duranthrene colours in fastness, some of the Durindone series are of excellent fastness to chlorine, and even surpass certain of the Duranthrene colours in this respect. The dyed samples include some beautiful tones, and full directions for use are given.

Points from Our News Pages

At the dinner given to Dr. Casale and the directors of Casale Ammonia Co., Dr. G. C. Clayton made an interesting statement on the subject of synthetic ammonia production in this country, and the utility of the Casale process. A sketch of Dr. Casale is reproduced (p. 450-1). Letters are published on "Waste at the Top" (P. Smith) and "British Plant for Canada" (S. J. Tungay) (p. 453). Indian chemical notes include interesting trade figures (p. 456). At the resumed hearing of Dr. Davidson's claim, the question of inventor's expenses was commented upon by the judge (p. 470). The death is announced of Mr. A. H. E. Allhusen (p. 459). Our London market report reveals brighter business, although demand is still below normal. The export market is featureless (p. 464). The Scottish chemical market shows moderately good business in Heavy Chemicals, but export inquiry is disappointing (p. 467).

The Calendar

1925 May		
11	Ceramic Society: Annual Meeting. 7.30 p.m.	Central School of Science and Technology, Stoke-on-Trent.
14	Oil and Colour Chemists' Association: "Artists' Colours." Dr. P. May.	8, St. Martin's Place, Trafalgar Square, London.
19	Ceramic Society: Refractory Materials Section. Spring Meeting.	Palace Hotel, Buxton.
20	Society of Glass Technology.	London.
21	Chemical Society. 8 p.m.	Burlington House, Piccadilly, W.
27	West Cumberland Society of Chemists and Engineers. Discussion: Smoke Abatement. Introduced by H. Hoy. 7 p.m.	Workington.

British Interest in the Casale Ammonia Process

Reception of Dr. Casale and Colleagues in London

THERE was a large company at a dinner given by Dr. J. F. Crowley, at the Royal Automobile Club, London, on Thursday evening, April 30, to meet Dr. Casale and the directors of the Casale Ammonia Co. Dr. Crowley presided, and the guests included the following:—

Dr. Luigi Casale, Mons. Bouchayer (president of the Casale Co.), Sir Charles Parsons, Mr. J. McNeill (High Commissioner of the Irish Free State), Mons. Bungener, Sir Henry Slesser, K.C., Mr. T. P. O'Connor, M.P., Mr. George Balfour, M.P., Dr. G. C. Clayton, M.P. (United Alkali Co.), Mr. W. B. Woodhouse, Colonel R. K. Morcom, Sir Robert Robertson, Mr. W. H. Patchell, Sir George Hume, Sir Thomas Holland, Mons. Boyoud, Dr. Hele-Shaw, Professor J. R. Partington, Mr. H. Bredius, Mr. W. J. E. Binnie, Mr. F. S. Spiers, Major J. D. Hall, Mr. V. O'Hara, Baron D'Ornellas, Mons. Marcel, Alderman F. C. Linfield, Mr. Ian Murray, Mr. E. M. Bergstrom, Mr. A. M. Harker, Sir Richard Gregory, Mons. Jaquetti, Mr. J. W. Milne, Mr. O. K. Beattie, Mr. T. J. Kiernan, Mr. H. G. Judd, Dr. E. Fyfe, Mr. R. A. Punter, General Gey Van Pittuis, Mr. E. R. Wynne, Colonel D. M. Stewart, Major C. M. Higgins, Mr. J. Plunkett Dillon, Alderman A. Baker, Mr. R. T. G. French, Mr. H. M. Lyons, Mons. P. Christ, Colonel Giuseppe Albisetti, Dr. J. Nesda, Mr. E. Williams, Mr. J. McConnel, Mr. G. K. Menzies, Mr. C. Rodgers, Mr. W. Shearer, Mr. C. E. Parker, Sir Alfred Cope, Mr. A. H. Beatty, and Mr. Lee Murray. Messages of apology for inability to attend were read from Sir W. Bragg, Professor G. T. Morgan, Sir E. J. Russell, Sir J. Simon, General Seeley, Professor Carpenter, Sir W. Pope, Mr. Allbright and others.

Science's Debt to Italy

The CHAIRMAN, in proposing the toast of "Dr. Casale," referred to the debt of gratitude which science in general owed to Italy, and remarked that early workers in science were slow to recognise the close connection existing between one branch of science and another. A connection between electricity and chemistry was scarcely possible of demonstration prior to 1800, as it was only in that year that electric current of high-amperage and at low voltage was for the first time made available in the laboratory by means of the battery of Volta. Prior to that date, however, in 1797, Cavendish showed that nitrogen and oxygen could be combined by means of an electric spark. The electrolysis of water was carried out by Nicholson and Carlisle in 1800, and many other substances were electrolysed by subsequent workers. The work of the succeeding years of the nineteenth century clearly indicated a close connection between electricity and chemistry. It was not until comparatively recent years, however, when knowledge had been accumulated on the application of electric power to the promotion of chemical change on a large scale, and on the economic production of large quantities of electric power at a suitable voltage, that electro-chemical industries on a large scale could be developed. The growth of these industries had been extremely rapid during the last quarter of a century, and their importance in the world to-day might be gathered from the fact that over two million h.p. in electrical energy was being absorbed by them, and that hydro-electric power was being sought throughout the whole civilised and even the uncivilised parts of the globe for use for electro-chemical purposes.

Nitrogenous Compounds

Possibly the most important electro-chemical industries to-day were those concerned with the manufacture of nitrogenous compounds. Combined nitrogen was a constituent of many of the most important chemical compounds which existed in nature or for which industrial uses were found. Nitrogen existed in vegetable and in animal tissues, and as a consequence it had to be a constituent of fertilisers, while it was also a constituent of explosives and of dyes. Professor Partington, whom he was glad to see present, stated, in a recent work, that "the fields of application of combined nitrogen are almost co-extensive with civilisation itself." In 1912 almost 60 per cent. of the world's consumption of combined nitrogen came from the natural deposits of Chile nitrate, 38 per cent. from by-product ammonium sulphate, and only 4.5 per cent. as a directly manufactured product. In 1920 barely 30 per cent. came from Chile nitrate, only 26½ per cent. from by-product ammonium sulphate, while 43.2 per cent. was produced by fixed nitrogen processes. These figures indicated a truly remarkable growth in the fixed nitrogen industry, and it was to this industry that the

guest of the evening, Dr. Casale, had made his greatest scientific contribution.

Dr. Casale's Work

During the great war a movement was started in Italian official circles with a view to finding some method by which Italy, which had much water power, but practically no coal, could manufacture for herself a large share of the supplies of fixed nitrogen required for her war needs. The authorities considered the names of all the possible leading scientists who could be appointed to take charge of this work, and finally decided on Dr. Luigi Casale, who was at that time a lecturer in the University of Turin. Dr. Casale was induced to resign his teaching appointments in order to devote himself wholly to research in this great field, and the results of his work in this connection were a tribute to the foresight of the Italian authorities of that period. The researches were started about 1916, and as the means available for the carrying out of this work were quite inadequate, they only made slow progress. At a later stage an American financier, who had large interests in Rome, Mr. Rene Leprestre, and who was to have been present that evening, but found himself at the last



DR. LUIGI CASALE.

moment too ill to come, came to the rescue and found the money required for carrying on the work on an extended scale.

In 1920 ammonia was produced in the laboratory for the first time, and almost immediately afterwards an initial semi-technical plant was set up for the continuous production of about 300 kg. of ammonia per day. A larger plant to produce 1,000 kg. per day was next put into operation, and in July, 1923, a plant capable of producing 3 tons per day was working, while a plant with a capacity of 7½ tons per day had also been constructed. The progress of the Casale process for the production of synthetic ammonia had been extraordinarily rapid since 1923. The rights for the process had already been taken up in most of the countries of the world, and plants were now in operation in Italy, Spain, Switzerland, Japan and the United States, while a considerable number of further plants were under construction for other countries.

The Late Dr. Harker

It was interesting to note that when his late colleague, Dr. J. A. Harker, was instructed in 1923 to prepare a report on the Casale process, probably the first outside report to be made on the process, he cabled after his investigation that the process "differed in detail greatly from existing processes, was simpler, and less costly to instal." He was much pleased with it, and recommended that negotiations for the rights of the process should be entered into. The judgment of Dr. Harker, whose recent death in the midst of his work, and with much of that work incomplete, was universally regretted, had been proved to be absolutely sound. During the last six months it was announced in the technical Press that the

French Government, which had secured the right under the Treaty of Versailles to acquire on terms a licence for a great German process, and which by virtue of its subsequent agreements had in any event to pay royalties for that process, decided to put down at Toulouse a great national plant capable of producing 120 tons of ammonia per day, or approximately equivalent to 500 tons of ammonium sulphate, on the Casale principle.

As indicating one aspect of the great success achieved by Dr. Casale, it was interesting to note that when the members of the British and French Commission attached to the Inter-Allied Control Commission visited Oppau, the great German nitrogen works, during 1919, they were told by the German chemists there that even if the French or British could erect plant identical with that at Oppau or Merseburg, they certainly could not operate it "for lack of the highly trained workers who are absolutely essential to successful operation." In Dr. Harker's report on the process of Dr. Casale, he stated, "One of the things which struck me most about the working of the Terni plant was that none of the individuals concerned appeared to regard the operations they were conducting as anything out of the common. They one and all abstained from posing as heroes by reason of the success they had helped to attain." This simplicity of operation might be regarded as one of the most striking features of the Casale process. Dr. Harker added that the plant he investigated had been put into operation for the first time two days before his arrival at Terni, but he found it "working perfectly normally as if the staff had been long accustomed to its operation."

British Financial Participation

The Casale Co. was now a great international concern with, he was glad to say, a strong British financial participation. This was, he believed, the first time that British finance had taken an important part in the development of the synthetic ammonia process on an international scale, and he was proud of being associated even in a small way with the securing of this result. Nitrogen compounds were of the utmost importance in agriculture and for national survival in war. It was estimated that there was lost from the soil of the United States every year by the growth of crops the net equivalent of 22,750,000 tons of Chile nitrate or 17,750,000 tons of ammonium sulphate. The practice which was at present being followed of putting fresh virgin soil into cultivation each year could not be indefinitely pursued, and the growth of population with its increasing demands on the soil imperatively demanded the more extensive use of fertiliser. Even in the older countries of Europe, it was now well recognised that the increased use of fertiliser led to greatly enhanced outputs of crops per acre, and that the greater use of fertiliser in particular countries was responsible for the advantage such countries had secured in the output per acre their agriculturists were able to secure. It was interesting to note in this connection that the Department of Agriculture of the United States Government recently stated in a report, "There is a general consensus of opinion in this country that the direct synthetic ammonia scheme of nitrogen fixation offers greater promise of cheap nitrogen than any other process at present."

Science, the Chairman concluded, owed a deep debt of gratitude to their distinguished guest for the work he had done to develop the direct synthetic ammonia process which bore his name. Industry owed him a great debt. They were present that night to discharge that debt in part, and in doing so they were paying honour also to "the potent charm wizard Science gives to Art." (Applause.)

Dr. CASALE, who was very warmly received, and who spoke in Italian, briefly replied to the toast.

The Casale Ammonia Co.

The toast of "The Conseil d'Administration of the Casale Ammonia Co." was proposed by Mr. George Balfour, M.P., who strongly advocated British co-operation in the process, and supported by Mr. T. P. O'Connor, M.P., who emphasised the international character of science.

Mons. BOUCHAYER, President of the company, replied in French, thanking the company for their warm-hearted welcome and for the assurances of British support.

In replying to the toast of "The Chemical Industries," proposed by Colonel R. K. Morcom, Dr. G. C. CLAYTON, M.P., explained that he was present in the place of Sir Max Muspratt, who was abroad. The chemical trade and business of this

country, he remarked, had been built up on the invention and discovery of a Frenchman, La Blanc. The process was worked out here, and on it the British chemical industry was largely built up. "We in turn," Dr. Clayton proceeded, "through the discovery of Perkin, inaugurated the coal tar dye industry, which was developed later in Germany and has now returned to this country. We are going to make a further success of that. In this country also the original research for the ammonia-soda process was worked out by the genius of Englishmen. That process was inaugurated and made successful in Belgium and is now carried on in every country which has a suitable brine. It is the proud boast of chemists that their genius gives processes to the world which are for the benefit not only of their own country, but of the whole civilised community."

Dr. Clayton welcomes the Casale Process

"We are here to-night to do honour to Dr. Casale for his great work in connection with synthetic ammonia. Synthetic ammonia was first worked out, I believe, in Norway, and later in Germany, because the Germans realised that if they were going to carry out a great war they must make Germany independent of the world in the matter of nitrogen products. They worked out the Haber process for themselves and so made themselves independent. In this country we were



MONS. H. BOUCHAYER
(President of the Casale Ammonia Co.)

fortunate in having a navy which could keep control of the seas and which therefore enabled us to carry on the war with nitre from Chile, coupled with ammonia from gasworks and gas producers. But we were very hard pressed. We had to get from Norway large quantities of calcium nitrate to convert into ammonium nitrate for amidol. In view of those dangers it was decided that for the future we must have our own sources of synthetic ammonia. We have at Billingham a Haber plant working satisfactorily, but it is only one plant, and the fact that it is only one may be a great danger in case of air raids. We cannot depend solely on one plant. Moreover, a Haber plant, to be successful, must be a very large installation. The Casale plant can be made in smaller units, which could be spread over the country, and that wider distribution would greatly minimise the risk from air raids. I am only too pleased to join to-night in welcoming Dr. Casale with his great invention to this country, because in my opinion we must have several sources of ammonia if we are to be in a position of security. Ammonia is not only essential for war purposes; it is also the best means for the intensive cultivation of the soil. Therefore, we have both for peace and for war in Dr. Casale's process a great means of safety for this country." (Applause.)

In acknowledging the toast of "The Chairman," proposed by Mr. W. B. Woodhouse, Dr. CROWLEY urged the importance, in the matter of licences for such processes, of Canada being included in the British Commonwealth instead of being included with the United States, however friendly they might be with the American nation.

The Proposed Protective Duty on Superphosphate

Agricultural Witnesses in Opposition

WHEN the Committee which is inquiring into the application of the Fertiliser Manufacturers Association for a duty on imported superphosphate resumed its proceedings on Thursday, April 30, the CHAIRMAN (Sir Arthur Whinney) announced that the Committee had received a letter from the Diamond Colour and Chemical Co. (merchants) of York, enclosing a statement relating to the cost of manufacture of superphosphate in Belgium, and to foreign competition generally, and the Committee were of opinion that Mr. Van den Bergh, a representative of that firm, should be invited to give evidence.

With regard to the point made by the Fertiliser Manufacturers Association, that if the superphosphate industry were not protected, the country's capacity for the production of sulphuric acid might be seriously reduced, which would lead to difficulty in the event of war, the CHAIRMAN referred to the fact that sulphuric acid was a by-product of zinc manufacture. It had been suggested to the Committee that the matter might be somewhat elaborated, and the National Smelting Co., who were mainly concerned, were prepared to give evidence on the point. He considered it desirable that a representative of the National Smelting Co. should be invited to attend. A representative of the Amsterdam Superphosphate and United Chemical Works, who was in England, was also prepared to give evidence.

SIR CASSIE HOLDEN then discussed the point as to what constituted an export bounty.

Sulphuric Acid Production

COLONEL R. L. NORRINGTON (director of Charles Norrington and Co., Ltd., Cattedown, Plymouth) dealt with the production of sulphuric acid. The zinc concentrates which were the raw materials used by the zinc smelters contained sulphur, and the sulphur had to be got rid of practically entirely. Not more than 2 per cent. of the sulphur must be left, otherwise the resultant spelter was ruined. In order to get rid of the sulphur the concentrates were roasted, the roasting process producing sulphur fumes. The smelter was not allowed to emit those fumes into the atmosphere, and the only thing he could do was to make sulphuric acid. He was informed that at the present time, and under present arrangements, the maximum amount of sulphuric acid that could be produced by the entire zinc smelting works in the country was about 100,000 tons per annum, or about one-tenth of the present abnormally low total consumption in the United Kingdom. The profit on the zinc smelting process was so small that it could not carry any losses on the sale of sulphuric acid, so that it had to be sold without loss, and, if possible, at a profit. There was a further difficulty in disposing of the acid, by reason of the fact that that produced from the zinc manufacturing process was produced very largely in one place—namely, Avonmouth. Acid was difficult to transport, and entailed considerable expense.

The CHAIRMAN asked how much more than the 100,000 tons per annum could be produced by zinc smelting.

The WITNESS replied that he did not think the production could be expanded at the moment, because the zinc concentrates were not available.

The CHAIRMAN said he gathered, from Colonel Norrington's evidence, that the consumption of acid in the United Kingdom per annum was about 1,000,000 tons. Assuming that 200,000 tons were made by superphosphate manufacturers, and 100,000 tons were made by zinc smelters, where did the remaining 700,000 tons come from?

The WITNESS replied that it was made by other acid manufacturers who sold it for other manufacturing processes. It was due, he added, to the falling off in the consumption of home-made superphosphate that the amount of acid made and used by superphosphate manufacturers had decreased. The plant still existed, however, and was capable of producing more. In time of peace the superphosphate trade was the largest absorber of sulphuric acid, and if the works were compelled to close down through unfair competition the country's sulphuric acid-producing capacity would be reduced, which would be serious in time of war.

With regard to prices, the witness said he had received a letter on April 24 offering foreign superphosphate 30 per cent.

at 49s. per ton c.i.f., and 35 per cent. superphosphate at 55s. per ton c.i.f. As to the depreciation of acid plant, he said that in his experience, if it were shut down for six months or more, it would deteriorate so rapidly that it would have to be practically rebuilt before it could be used again.

This closed the case for the Fertiliser Manufacturers Association for the time being, and further evidence is to be called at a later stage.

A Farmer's Evidence

MR. GEORGE BAYLIS, a farmer, of Wyfield Manor, Newbury, gave evidence, independently, against the imposition of a duty on imported superphosphate. He said that less roots were grown than in 1913, and any increase in the price of superphosphate would further curtail the root acreage, and thus compel the farmer to reduce his flock of sheep. Without cheap superphosphate, corn growing with artificial manure was a dead letter. An import duty on foreign superphosphate would result in a reduction of the area planted with roots, which meant that less sheep would be kept, and there would be a diminution of soil fertility thereby. English potato growers would not be able to compete with France, Holland, and Belgium if superphosphates were taxed. Again, all manures containing phosphate would be advanced in price. Dear superphosphate would occasion a large decrease in arable land, and in the number of labourers employed on the land.

Central Chamber of Agriculture

MR. R. G. PATTERSON (representing the Central Chamber of Agriculture) said that that body was thoroughly representative of landowners, tenant farmers, and workers in the United Kingdom. The Chamber were alive to the necessity for the application of fertilisers to the land, if maximum production was to be maintained, and their opinion was that if the ruling prices of manures were reduced, the demand for superphosphate would be very materially increased, and this in turn should tend to reduce the overhead charges of manufacturers, and allow more men to be employed in the industry. The Chamber were firmly of opinion that a duty on superphosphate would mean increased prices to the agriculturist; the purchase of this valuable manure would be less than at present, and the produce from both arable and grass land would be seriously reduced. Less labour would also be required by the superphosphate manufacturers as the result of the reduced demand. If a duty were levied on superphosphate, it would mean (a) a sympathetic advance in other phosphatic and complete fertilisers; (b) an application from slag and bone manufacturers for a duty for their products, as well as from makers of all other agricultural requirements; (c) a consequent all-round advance in the costing of the agriculturist, and, if production were to be maintained, an advance in prices of farm products to the consumer. The Chamber submitted that it was not a wise procedure to leave the fixing of the price of any article in the hands of a powerful group of manufacturers, the restraining influence of the equivalent foreign article being removed.

Replying to questions put by the Committee, Mr. Patterson said he could not say that an increase of 10s. per ton in the price of superphosphate would result in displacing a single agricultural labourer, but the tendency resulting from the placing of a tax on imported superphosphate would be for makers of other agricultural requirements to apply for protection and increase their prices, and the cumulative effect would certainly be to displace a great deal of labour.

The CHAIRMAN pointed out that every applicant for an import duty had to bring himself within the Safeguarding of Industries Regulations. He had to prove, for instance, that competition from foreign countries was exceptional, and it did not follow that if the makers of every kind of agricultural necessity made an application they would succeed in establishing a case. But if they did, the effect on agriculture would depend upon the extent to which the cost to the farmer was increased.

MR. PATTERSON said it would mean that the farmers of second-class land would have to go out of business, though possibly the farmers of better class land would be able to hold on. He added that the high cost of cultivation of arable land

had resulted in a large amount of that land having been turned over to grass.

SIR CASSIE HOLDEN, cross-examining, suggested that the general experience was that a manufacturer or an agriculturist passed on his increased costs to the consumer.

MR. PATTERSON replied that farmers never could pass on anything to the consumer; they were faced with unrestricted competition, which governed their prices.

SIR CASSIE HOLDEN asked whether, assuming that the super-phosphate manufacturers would have to go out of business if a duty were not imposed on the imported article, the witness would prefer to pay 10s. per ton more for the British product or to leave the field entirely to the foreign producer.

The WITNESS replied that he did not think there was a ghost of a chance of the manufacturers going out of business. As an individual he would rather have the foreigner out of the market here, but, speaking as an agriculturist, he did not think there would be any greater danger to agriculture if the control were entirely in the hands of the foreigner, than if it were entirely in the hands of the Fertiliser Manufacturers Association.

SIR CASSIE HOLDEN said it was not desired that the control should be in the hands of the Association, and he had already offered that the price should be controlled by the Minister of Agriculture or any competent Government body.

Asked by the Chairman if there was sufficient competition among foreign manufacturers to keep the price safe, the witness said that if the price was increased above its economic value to the British farmer, the latter would not buy it. They could get all the necessities for the soil from farmyard manure. If the amount of arable land was seriously reduced they would be able to make ample farmyard manure to deal with it, and would be independent of artificial fertilisers, except for grass land, which could take its chance.

The Committee adjourned until May 13.

Waste at the Top

To the Editor of THE CHEMICAL AGE.

SIR,—With reference to the present inquiry into the state of our heavy engineering industry, so essential to our very existence as an industrial community, I was recently negotiating manufacturing, and financing for certain special equipment connected closely with the chemical industry, of which the potential foreign demand quite equals in estimated turnover a fair-sized shipbuilding yard.

I made inquiries as to "costing" seeing that profit rates and cost prices were a very important part of the proposal, and found usually that "works overhead" was exceptionally heavy, but in one instance at least this was only a minor matter compared with "head office expenses and overheads," which I was informed in my own case would likely be 120 per cent., far more than works production costs and overheads put together, so that I then began to negotiate abroad, where to-day I could make a long-time contract on very advantageous terms if I cared to.

Granting that materials, wages, trade union limitations, rents, bank charges, rates, freights and taxation, etc. are all very important, I would respectfully suggest that there must also be, in this field especially, waste at the top, which make the present prices such that a more economically managed works gets the business (which it deserves).

It is apparent that quite a large number of questions will have to be examined in determining why England is here losing her lead. It is, however, better rather to operate and cure than let the patient die.

The blame is not chargeable alone to either labour or capital as such, but more directly to that policy which tolerates waste as a minor matter, and thinks that because big profits and small competition prevailed yesterday, it must always continue so.

Some firms could usefully relieve themselves of a few burdens before expecting legislators and negotiators willingly to help them further. They would in such a case have public favour to a greater extent if they had adopted the policy of "payment by results" all round, from the bottom right to the top. It might be worth a trial for these reasons alone, although it is a bit novel, and would alter many a man's status and earnings.—

Yours, etc.,

P. SMITH.

Derwent Chambers, Derby.

May 6.

British Plant for Canada

To the Editor of THE CHEMICAL AGE.

SIR,—It is very gratifying, in view of the complaints one reads in these recent days regarding competition in chemical plant and engineering, for us to announce to you that we have just succeeded in securing a contract for the supply of two large gas scrubbing towers, each having a capacity of 5,750,000 cubic feet of sulphur gases per day.

These scrubbers for sulphur gas are of a somewhat unique patented design, and are being supplied to the Mond Nickel Co., of Canada, for installation at the extensions of their plant at Coniston, Ontario, Canada.

In view of the fact that the order for this installation was taken against Continental and United States competition, it is interesting to note that this country is still able to produce installations for the chemical industry, which hold their own against the other sources of manufacture referred to.—

Yours, etc.,

HAUGHTON'S PATENT METALLIC PACKING CO., LTD.
30, St. Mary-at-Hill, E.C.3. S. J. TUNGAY, Director.

May 4.

Water in Cement Problems

Paper Before Petroleum Technologists

In his paper on "Some Notes on Water Shut Off," read before the Institution of Petroleum Technologists in London on Tuesday, Mr. F. G. Rappoport said that the question of water shut off was of interest to the geologist, the chemist, and the engineer. He divided his paper into these sections, and under the chemical referred to water analysis and cement manufacture.

Chemical analyses of different waters struck in the progress of drilling a well helped in the general determination of the position of these waters in a field. In the case when water had again been struck after a water shut off had been completed, it was important to know whether this ingress was due to the shut off being defective, or to another water source struck below. Levels of the liquid might assist in forming a judgment, and finally direct tests by plugging the well up and testing from point to point might have to be resorted to, but the water analysis was an important link in the chain of evidence.

Water analyses should be tabulated in some convenient form for ready comparison.

Mr. Rappoport said that the use of cement required careful supervision and testing. The initial setting point, and the period during which the actual hardening took place were the two important factors. Those could be initially determined by laboratory process, and indicated the character of a particular cement. The laboratory test character of a cement might diverge considerably in actual use for a variety of reasons, some physical, some chemical, and others mechanical.

Investigation was required on the quantity of water for mixing. The quantity of water used for mixing a cement was in excess of that necessary just to effect hydration, in order to preserve the necessary fluidity. That excess delayed the hardening point and extended the time of final hardening. Forty per cent. was the usual percentage of water in mixing a grout for well cementation purposes. Good and intimate mixing of the grout before application was necessary. Pumping the grout under pressure would permit a thicker grout to be used. The strength of a cement increased as hardening proceeded.

Circumstances that Affect Hardening

However carefully a grout might be carried to the point of application, it must somewhere come into contact with the waters of the well, and these might have a deleterious effect upon the setting and hardening qualities of a cement. Previous experimental tests with the well water might give important information in this respect.

This question was carefully investigated some years ago by a special commission in Baku, and the results showed that sea water and those particular well waters delayed the beginning and end of initial setting periods. It was also determined experimentally in Baku that the presence of oil in the well water had little or no effect on the hardening quality of the cement. The action of gas in a well, by causing agitation, might prevent a cement from hardening quickly or even at all. It was possible, however, by increasing the quantity of cement, that this action might be deadened. An increased temperature of the water used for mixing appeared to hasten the hardening and setting of a cement grout.

Progress in Vitamin Research

Dr. Zilva on Recent Experiments

A MEETING of the Manchester Section of the Society of Chemical Industry was held on Friday, May 1, Dr. H. Levinstein presiding.

Mr. Guy Radcliffe's Services

In recognition of the services rendered by Mr. L. Guy Radcliffe as secretary and treasurer of the Section for six years, he was presented by the members with a hall clock and a pair of Wedgwood vases, together with a ring for Mrs. Radcliffe. Mr. Radcliffe, in thanking the members, expressed his keen appreciation of the honour which had been paid him by the Section in electing him chairman for the ensuing two years. In his eyes, no greater honour could be conferred upon a Manchester man than to be elected to such a position, which had been previously occupied by so many illustrious men.

Progress in Vitamin Research

Dr. S. S. Zilva, of the Lister Institute of Preventive Medicine, gave a lecture on "Recent Progress in Vitamin Research." Experiments pointed to the fact that the vitamins were very low down in the scale of evolution. Recently it had been shown that certain plants contained vitamins. The importance of Vitamin A was mainly from the point of view of its influence on growth. Evidence was also forthcoming which suggested that the absence of it had some bearing on the occurrence of rickets, a disease associated with faulty deposition of calcium in the bone of growing animals. It soon became evident that the two factors were not identical. A series of experiments were carried out by heating cod liver oil for varying periods. It was found that although the sponge or paste which contained the A factor—in other words, the growth factor—was sufficient to induce growth, a greater quantity of the same paste was insufficient to deposit calcium. This disparity indicated that the two factors were not identical. The position at present was that there was sufficient evidence to justify the doubt whether the two things were the same, but they had never been separated. The chemistry of the thing had been mostly worked out in cod liver oil. Dr. Zilva described the steps which had been taken to extract the active principle, and the fractionating.

During the last two or three years another interesting subject had been developed which had a bearing on vitamins. That was the function of light. Very startling observations had been made of the action of light on animals and human beings and its effect upon the production of calcium in bone. It had long been known empirically that sunlight was a great prophylactic and an aid to general physical well-being, but new light was thrown on the subject by the very striking results obtained by exposing rachitic children to ultra violet light. The work was soon extended to animals. When exposed to the ultra violet light rickets was either cured or prevented where it would otherwise have occurred. The next step was to ascertain how the activity was affected by varying wave-lengths of these rays. It had been found that wool and cotton wool interfered with the activity of the light in proportion to their thickness. Black material absorbed more of the active rays than white material.

During the last twelve months it had been found that cotton seed oil and linseed oil, which were known to be very poor, almost inactive, from the point of view of vitamins, became active when exposed to the ultra violet rays. In trying to find out the chemical constituent responsible for this change it was ascertained that the cholesterol in cotton seed oil, although inactive itself, became very active. There was no doubt that a great many substances were activated temporarily by the light.

With regard to scurvy, before the period of investigation and experiment began, it was generally acknowledged to be due to faulty food and to be rectified by a modification of the diet, such as the use of fresh vegetables. He traced the process of investigation which led to the discovery of the anti-scorbutic factor. Research had been made into the effects produced by the germination of grains and pulses, and by the exposure of anti-scorbutic solutions to ultra violet rays, or by aspirating them with air. Removal of the acids produced a solution which contained all the activity, thus disposing of the possibility that the vitamin was associated with the acids. It had become possible to produce highly competent anti-

scorbutic preparations, which had been tried clinically and found of great use, especially in cases where the scorbutic condition was complicated by gastric disturbance and other methods would have done harm. These preparations had been stabilised for over five months in the laboratory. There was no loss of activity, and what was shown in the laboratory was demonstrated in actual practice. The next step in the work of research was to remove the sugar from the neutral active residue, and Dr. Zilva demonstrated how experiments had shown by chemical means that the sugar did not contain the anti-scorbutic factor.

Properties of Motor Fuels

Professor Brame's Third Lecture

THE last of the series of three "Howard" Cantor Lectures by Professor J. S. S. Brame, on "Motor Fuels," to the Royal Society of Arts, was delivered on Monday, May 4.

Professor Brame continued his consideration of the physical properties of the motor fuels, and dealt first with calorific value, emphasising the bearing which the density of the fuel had upon the calorific value. The calorific value, by weight, was not very widely different, but in connection with the British thermal units per gallon there was a marked difference in favour of those fuels which had a high density.

Carbon Monoxide Dangers

Dealing with the question of carbon monoxide from the point of view of the dangerous conditions that might arise through its production, Professor Brame said that, in investigations carried out in the United States, Fieldner and Jones had found that the average air/fuel ratio for 100 engines tested was about 12.5/1, which gave an average carbon monoxide of about 6 to 7 per cent., meaning about 30 per cent. wastage of fuel. Carbon monoxide was highly poisonous and the amount required to produce unconsciousness was estimated somewhat differently by different authorities, but it was generally accepted that 0.2 per cent. of carbon monoxide in the air was dangerous and 0.4 per cent. would produce unconsciousness, and might be fatal in one hour. The danger was that unconsciousness came on without the person being aware of the fact that he was being gassed. There was great danger in running an engine in a badly ventilated garage.

On theoretical grounds the thermal and mechanical efficiency of an internal combustion engine should be greater the higher the degree of compression of the fuel/air mixture, and in practice this was recognised to be the case. Ricardo, with the variable compression engine, demonstrated, for example, that with a particular fuel the indicated thermal efficiency of 27.7 per cent. was obtained with a compression ratio of 4:1, and 37.5 per cent. with the ratio increased to 7:1, a gain of 36 per cent. As the compression of the fuel/air mixture rapidly raised the temperature of the charge, it followed that if the compression of the mixture was sufficiently high the charge would pre-ignite. The liability of pre-ignition would appear, therefore, to be directly related to the ignition point of the fuel/air mixtures. By adiabatic compression Ricardo obtained the following ignition figures:—Petrols 353-367 deg.; benzene, 419 deg.; toluene, 422 deg.; ethyl alcohol, 514 deg. C. Another phenomenon, however, took place before pre-ignition with many fuel/air mixtures, viz., detonation, which was known as "pinking," and Ricardo had shown that persistent pinking often gave rise to true pre-ignition. There did not appear to be any direct connection between the ignition temperature of the mixture and its tendency to detonate. Ricardo found that carbon disulphide, with the low ignition point (with air) of 275 deg. C. would stand compression to a ratio of 5.15/1, whilst an aromatic free petrol with an ignition point (with air) of 353 deg. C. gave detonation with a compression of 4.85/1. The reason for this anomaly might possibly be the rate at which the initial combustion reaction speeded up the point of detonation.

The problem of detonation and anti-detonating fuels and compounds, said the lecturer, had been widely investigated in the United States. One per cent. of xylydine added to a fuel with detonating tendencies enabled the compression to be raised about 10 lb., and it was shown that xylene was better than toluene and the latter better than benzene. Alcohol was much better than either. The addition of small amounts of aromatic hydrocarbons to paraffin fuels was found to have

but a small effect in suppressing detonation, and Midgley and Boyd concluded that not less than 20 per cent. of benzene was required to be effective. The relative value of xylene, toluene, and benzene was evidently open to some question in view of the contradictory results of investigators. In addition to xylidine several other nitrogen compounds were effective—for example, aniline, but the primary and secondary amines, particularly diphenylamine, were the most effective of this class. On the other hand, certain compounds would induce detonation, thus organic nitrates and nitrites—isopropyl nitrite being a good example. A point of particular interest was that the addition of such a powerful anti-knock as lead tetraethyl certainly did not raise the spontaneous ignition temperature of a fuel, neither did knock inducers lower it, indeed Ormandy and Craven had stated that the effect of either was directly the reverse. It was stated in 1924 that 200 million gallons of gasoline containing lead tetraethyl had been distributed in the previous two years in the United States. Used alone trouble had arisen from the deposition of lead on sparking plugs, etc. The trouble had been overcome by adding small quantities of volatile organic halogen compounds, so that on combustion the lead was mainly converted to lead chloride or lead bromide and was mostly blown out with the exhaust gases.

Ethyl fluid was the commercial name for the concentrated solution of the lead tetraethyl and ethylene di-bromide was a special adjunct to the petrol supply.

Manufacturing Difficulties

Unfortunately, the manufacture of tetraethyl had led to some fatalities, and several non-fatal cases of poisoning, and at the end of 1924 it was stated that no more "ethyl gas" would be placed on sale for a time. It was stated to be about one twenty-fifth as toxic as mustard gas. It finds entry to the system through the fatty tissues and is deposited in various parts of the body, including the brain. The effect is not cumulative, however, as with most lead poisoning. This poisonous character was certainly a drawback. The dangers from lead compounds in the exhaust gases had been investigated by experts in the United States and the main conclusion was that "no indication of plumbism was found in any of the animals (over 100) used, although they were exposed for 188 days during a period of approximately eight months to exhaust gases from ethyl gasoline in concentrations with respect to lead content that are several times that allowable from the standpoint of the carbon monoxide."

Indigo Prices and Possibilities

MR. F. T. T. REYNOLDS, writing in the *Manchester Guardian*, says, in reply to previous correspondence, that a single concrete illustration is by far the most effective method of arresting attention and carrying conviction. "Indigo is not only one of the oldest but is also still one of the most important dyes in general use throughout the world. 'Free Trader' showed clearly how greatly the textile trade as a whole is penalised by having to pay, for already over four years, twice as much as foreign competitors for all the indigo used. The case of indigo is below rather than above the average dye detriment, and a subsidy alternative hardly meets the case. Surely if France and Switzerland and the United States can make 20 per cent. indigo and sell it profitably at 8d. per pound there is no valid reason why the same cannot be done here. I know that taxes, rates, fuel, wages, freightages, and overhead charges are intensified in this country, but many dyes and chemicals are being made and sold here to-day at as low or lower prices than in any other part. The countries named have little or no fundamental advantages in raw materials and component parts over Great Britain. Therefore, if the interest that has the combined monopoly in the selling of British-made and also any imported synthetic indigo cannot sell at less than double the price of their foreign competitors it surely suggests efficiency rather than subsidy as the true remedy, supplemented perhaps by some healthy competition and practical evidence that the margin of real profit is not complicated by the need to make indirect subsidies to other departments.

"Aniline oil and salt are being made and sold here to-day at prices relatively lower than before the war. This being so, there is no justification for the price of synthetic indigo being more than double the pre-war price and quite double the price current in other producing countries to-day."

Gas from Heavy Oils

Description of the Hakol System

MR. J. E. HACKFORD read a paper at the meeting of the London Section of the Society of Chemical Industry on Monday, in which he described the Hakol system of generation of gas from heavy oils by partial distillation. The oils used in this apparatus, it was explained, may vary considerably, but heavy bunker oils of 950 sp. gr. and upwards were mentioned as the type of oil suitable for treatment for the purpose, these being referred to as not universally satisfactory for use in high compression engines. The plant in question has been designed as the result of a consideration of the reasons which have led to the non-success of similar plants in the past, and it is claimed that the difficulties of maintaining an output of gas of constant calorific value have been overcome. The two essentials of such plants are (1) the maintenance of continuous and uniform temperature in the generator itself, and (2) the necessity for keeping the generator free from tar. Incidentally, mention was made of the fact that although in many of the early patents it was claimed that coke and asphaltum were not formed in the particular apparatus, means were provided for removing it. The development of generators for producing gas from these heavy oils has, in the past, led to the use of baffles in order to assist combustion, whilst simultaneously externally heated generators were developed in order to ensure a requisite decomposition temperature for the fuel. This temperature lies between 100 and 1,100 deg. C. Later, a combination of external heating and baffles was preferred, the external heating only being used whilst lighting the furnace.

Final Form of Generator

The final form of generator which the author evolved, after experimenting with many types, is capable, it is claimed, of maintaining constant temperature, and coke does not form, and the further claim is made that by having a suitably shaped generator, coke and heat troubles can be avoided without resort to baffles and external heating. In this way the generator can be simplified to a great extent. It became obvious during the experiments, that automatic control is needed to govern the relative proportions of oil and air, if regular results are to be obtained, and, further, that the preheating of the oil and air can be automatically accomplished by the generator instead of being left to the discretion of the operator. The generator as now made relies upon the heat of partial combustion to provide sufficient heat to carry on the cracking process indefinitely. The greater the percentage of oil that is burned in the generator, the higher the internal temperature but the calorific value of the gas is lower. Some interesting figures were given showing the change in composition of the gases with varying temperature and a device is embodied in the generator for giving a special shape of flame. Efficiencies varying from 80 to 93 per cent. have been obtained from tests made with different types of oil, it being found that an oil of 950 sp. gr. is easier to handle than a light oil of 850 sp. gr. On the other hand, the gases evolved from the heavier oil are dirtier than those obtained from the light oil on account of the increased temperature which breaks down the molecular weight of the gases more quickly and induces the formation of lamp black, which latter varies proportionately with the density of the oil, but is also influenced by the shape of the generator and the time of the stay of the gases within it. A heavy Mexican oil of 980 sp. gr. yields up to 10 per cent. of carbon black. The gases obtained with the process vary from 155 to 190 B.Th.U. per cubic foot. The sulphur content of the gas is low.

Small Space and Low Cost

Many complimentary remarks were made concerning the process by those who have been able to watch the experimental work, and in reply to a request for further details, the author mentioned that a plant for generating 50,000 c. ft. of gas per hour would only be 36 in. long by 18 in. internal diameter, a fact which he anticipated would lead many people to adopt the process who now could not use producer gas on account of the large space occupied by the ordinary producer gas plant. He also claimed to be able to generate gas at a much lower price than the lowest cost of town gas. The plant, it was added, is almost completely automatic.

Indian Trade in Chemicals

(FROM OUR OWN CORRESPONDENT.)

THE total imports of chemicals and chemical preparations, excluding chemical manures and medicines, into India during the year 1924 amounted to 216 lakhs as against 189 lakhs in the previous year, showing an increase of about 15 per cent. The imports of the principal classes were as follows:—

	Quantity in cwts.	Value in Rs. lakhs.
Acids	12,750	5,68,000
Ammonia and salts thereof	22,900	9,50,000
Bleaching materials	59,300	6,25,000
Disinfectants	35,500	11,30,000
Lead compounds	9,000	3,33,000
Magnesium compounds	100,000	4,00,000
Potassium compounds	22,700	7,00,000
Soda compounds	1,166,300	1,26,00,000
Sulphur	275,250	13,46,000
Zinc compounds	22,400	4,38,000
Alum	66,000	5,65,000
Aluminous sulphates	68,000	3,86,000
Arsenic audits oxides	1,655	1,27,000
Carbide of calcium	30,200	5,13,000
Copperas (ferrous sulphate)	10,900	46,000
Other sorts of chemicals	—	29,66,000

It will be observed that about half the imports comprise soda compounds, and of these sodium carbonate imports amounted to 842,500 cwts. valued at 59 lakhs. The acids showed an increase from 7,230 cwts. in the previous year to 12,760 cwts. in 1924, though the value showed but little change. Acetic acid increased from 1,818 cwts. to 2,892 cwts., a quite phenomenal increase, as it would appear, but not so, as compared with 1922 when imports thereof amount to 3,029 cwts. Imports of lead acetate and litharge more than doubled during the year—i.e., from 3,727 cwts. to 6,928 cwts., and from 996 cwts. to 2,134 cwts. respectively.

Details regarding soda compounds are as follows:—

	Quantity in cwts.	Value in Rs. lakhs.
Soda carbonate	119,000	10.7
Soda bicarbonate	13,600	3.8
Soda caustic	104,000	15
Soda sulphide	33,500	2.9
Sodium carbonate	842,500	59.2
Sodium cyanide	7,000	4
Sodium silicate	22,500	2.3
Other sorts	21,600	5.6

Details regarding the shares of the principal sources of imports are not yet available for the year, but from the statistics of the previous year, it may be assumed that about 65 per cent. are supplied by the United Kingdom, about 17 per cent. by Germany, 3 per cent. by the United States, 6 by Italy, and the rest by other countries. S. G. W.

Indian Chemical Industry Notes

(FROM OUR INDIAN CORRESPONDENT.)

THE total imports of building and engineering materials into India in the year 1924 are not inconsiderable and amounted to Rs. 116 lakhs. Out of this, cement alone was responsible for 69 lakhs. It is to be observed that imports of cement into India are on a declining scale. From a total of 134,000 tons, valued at 110 lakhs, in 1922, they have declined to 114,000 tons, valued at 69 lakhs, in 1924. This is due, of course, to the growth of the indigenous industry of India. A large number of works have recently been established in India, and Government is giving their product a preference as a matter of policy. Even then the indigenous manufacturers are clamouring for a protective duty on imports. Of the total imports of 114,000 tons of cement during the year, 98,000 tons were supplied by the United Kingdom, 6,500 tons by Germany, 3,000 tons by Japan and 6,000 tons by other countries. It may be mentioned that the leading firm of British manufacturers has established a very fine branch works in Bihar, which has proved successful. Imports of other materials are as follows:—

	Rs. lakhs.
Asphalt	11
Bricks (other than fire bricks)	0.5
Fire bricks	3
Tiles	20
Other kinds	12

The trade in fire bricks and tiles shows a steady decline, largely owing to the growth and improvement of indigenous manufacture. Asphalt was obtained in approximately equal proportions from the United Kingdom, Trinidad, and the United States. Fire bricks are almost entirely drawn from the United Kingdom, while the trade in tiles is practically divided between the United Kingdom and Italy. It deserves to be mentioned here that the demand for asphalt in India is increasing rapidly, as there are large programmes in all parts of the country for asphalted roads. S. G. W.

The British Association of Chemists

Education

THE Association owes its existence to the fact that no recognised standard of qualification can at present be applied to the profession of chemistry; but it becomes increasingly evident that however unsatisfactory a mere academic standard may be, it is the only criterion that can well be applied in practice.

It is obvious that, so long as laxity in this respect remains the rule, a satisfactory organisation of the profession is impossible, and upon this head alone all chemists who desire some regulation of entry into the profession, with the much desired unity that such regulation would help automatically to bring about, will be well advised to approach the Association with a view to membership and to support it in every possible way.

Having regard to these circumstances, the Association has always been interested in the question of education, and by means of its education committee carefully watches and considers all forms of education which are open to those seeking to enter the profession.

The Association does not view with sympathy any form of chemical training that does not demand of the candidate a high standard of theoretical and practical knowledge, and its scrutiny of the qualifications of those who do not hold a degree or diploma in chemistry becomes always more stringent. It realises, however, since no formal definition of qualification exists, that recognition only of those who are academically qualified is impracticable. Until the individual chemist realises the profession's chaotic condition in this respect and seeks the obvious remedy no individual organisation, however powerful or efficient, will be able to effect a certain cure. The Association is the one body that by reason of its constitution possesses the necessary machinery to regulate these unsatisfactory conditions. It requires only the support of a thoroughly representative majority to be able to pronounce a formal judgment upon this question of qualification.

The old method of apprenticeship is becoming less common, a fact that the Association has observed with satisfaction. There is, of course, no objection to such a form of training if it is supplementary to academic training, but in the past it has frequently replaced it, with results that in many cases have proved far from satisfactory. The Association is in favour of the student's obtaining experience under works conditions, but any form of training exclusively practical is, in its opinion, completely indefensible.

The whole question of the chemist's education is one which requires a searching review. At present the large majority academically qualify before any attempt is made to earn a livelihood, but there are still appreciable numbers who enter works at an early age and gradually, in some cases more or less automatically, rise to positions of responsibility. However justifiable and sound this procedure may have been in the past, its failure to meet the needs of modern industrial methods is now every day more apparent. It would be a serious matter if the Association were to merit the charge of an outlook too narrowly academic, but it is evident that formal regulations of definition have been too long neglected, and that a rapid movement in this direction is imperatively necessary.

The Association, therefore, claims a right to a voice in educational questions, since it is pledged to maintain a high standard amongst those who practise in chemical science. It appeals to all chemists who desire to see a high standard maintained and who wish for a more clearly defined position for the profession to enrol themselves as members and to support the Association in every possible way.

H. T. F. R.

The Huxley Centenary

Celebrations at Kensington

THE Huxley Centenary was celebrated on Monday at the Royal College of Science, South Kensington, when a lecture was delivered by Professor E. B. Poulton. Professor Poulton dealt not so much with Huxley's great work, but with the remarkable gifts and characteristics of the man that made such success possible. Huxley was an outstanding example to young men of to-day as the personification of tenacity of purpose, courage, and vision, and only by assiduous perseverance in the face of depressing difficulties did he make his mark. With Professor Poulton were Sir Charles Sherrington (President of the Royal Society), Lord Buckmaster, Sir Richard Gregory, Sir Thomas Holland Professor Bairstow and Mr. H. G. Wells. Mr. Herbert Wright presided.

The celebrations were continued in the evening at the Royal School of Mines, when a reception was held by Lord Buckmaster, chairman of the governing body, and Lady Holland, wife of the rector. The reception was followed by a conversation.

Chemical Exhibit

The laboratories and rooms were filled with exhibits illustrating the work of the various departments of the three colleges. The chemistry section proved of great interest to the large number of visitors, the sections devoted to glass blowing, liquid air demonstrations and dyed flowers attracted many. The Thiometer (making dirt talk!) proved interesting; this instrument was recently used to detect 1 part of hypo in 5 million parts of water. The material to be washed, such as viscose, photo film, etc., is placed in a tank, the water entering the tank passes through a conductivity cell, while the exit water containing the dissolved salts passes through another conductivity cell. These cells form the two opposing arms of a Wheatstone bridge, and any alteration in the conductivity is transposed into sound by means of a loud speaker. Other exhibits depicted time reactions, Brownian movement, Vortex precipitation, Emotimeter—for registering the state of the emotions by the temperature of the hand—colloidal metals, mists in chemical reactions, showing the influence of small traces of acid in producing fogs.

The organic chemistry exhibit consisted of examples of research work and of specimens obtained in the laboratory and also those obtained on a semi-industrial scale in the Whiffen laboratory. The chemical technology section contained apparatus illustrating the processes involved in filtration and pumping, demonstrations of surface combustion, methods of nitrogen fixation, and the speed of flame propagation.

Items of music were rendered by the string band of the Scots Guards.

Industrial League Conference

IN industrial circles a great deal of interest is being created by a conference which the Yorkshire Centre of the Industrial League and Council has arranged to be held in Harrogate over the ensuing week-end. From the Leeds district alone about 50 acceptances have been received, and a number of Harrogate people have intimated their intention to be present. In addition, there will be representatives from London and other parts of the country, and it is anticipated that a very interesting and useful week-end will be spent. At the first session on Saturday afternoon, under the chairmanship of Sir Edwin Airey, Mr. J. J. Mallon, Warden of Toynbee Hall, London, will introduce a discussion on "Education and Democracy" and in the evening Sir Ernest Benn, Bart., will propose: "That the interference of the politician in industrial matters is detrimental to the welfare of the people." It is expected that this subject will provoke keen discussion. The chairman will be Alderman Frank Fountain, of Leeds, and dinner and an impromptu concert are to follow. At the morning session on Sunday, under the chairmanship of Mr. J. J. Brailly, Vice-President of the Leeds Trades and Labour Council, two ex-M.P.'s, Mr. Charles Dukes (Leeds District Secretary of the National Union of General and Municipal Workers) and Mr. John Murray (of Wallingford and Oxford) will speak on the subject of Sir Ernest's motion, and at the closing session, when Mr. David Little (D. Little and Co., Ltd.) presides, an open discussion will take place.

Society of Glass Technology

New Officers for the Year

AT the annual general meeting of this Society, held in Sheffield on April 22, Colonel S. C. Halse was succeeded as president by Mr. T. C. Moorshead, director and general manager of United Glass Bottle Manufacturers, Ltd. To fill vacancies on the Council the following were elected: Vice-Presidents, Messrs. W. Butterworth, Junr., and J. H. Davidson; ordinary Members of Council, Messrs. B. P. Dudding, E. A. Hailwood, H. J. C. Johnston, E. Meigh, and G. Simpson. Councillor J. Connolly was re-elected general treasurer, and Mr. W. M. Clark, American treasurer. Professor W. E. S. Turner was appointed honorary secretary and Messrs. C. S. Davey and Dennis Wood, were elected auditors.

The retiring President (Colonel S. C. Halse) took as the subject of his presidential address "The Present State of the British Glass Industry." He pointed out that in certain important branches of the industry the unemployment returns provided no index to the relative state of the industry now and prior to the war. The wholesale introduction of automatic machinery had considerably reduced the number of men employed, whilst the production was simultaneously greatly increased.

Glass in Human Progress

At the ordinary general meeting which followed, the Society departed from its usual practice of having a series of technical papers. Instead, Professor Turner, at the invitation of the Council, delivered a popular illustrated lecture on "Glass as an Instrument of Human Progress." Professor Turner dealt with his subject in two main sections, namely, the place of glass in extending man's mental horizon and the use of glass in providing protection, comforts, and luxury. In the first section he dealt with the vast extent of knowledge gained through the application of the microscope, the telescope, the spectroscope, ultramicroscope, camera, and chemical apparatus. The second part dealt with the use of heating and illuminating glass and sheet glass for many purposes, and included reference to special spectacle glasses and Mr. F. W. Lamplough's new "Vita Glass" for transmitting ultra-violet light and to its use in hospitals, etc. Reference was also made to the pre-eminent position occupied at present by British-made optical glass.

Lead Poisoning in Industry

MR. E. HOLDEN, head of the Building Trades Department, Gloucester Technical Schools, lectured at the University College of the South-West, Exeter, recently, on the romance of lead in industry.

Mr. Holden said that the chief source of lead was galena, a compound of lead and sulphur, and commercial lead reached as high a degree of purity as 99.997 per cent. Lead, in some form or other, entered into over 150 industries. Referring to extensive studies of lead poisoning in factories, Mr. Holden said that it had been clearly demonstrated that inhalation of white lead dust was the most dangerous channel of infection. It had been stated by the Chief Medical Officer of Factories that if lead dust and fumes were removed or prevented, there would be no lead poisoning. When white lead was used as a paint material large quantities of dust were created in the process of dry rubbing down, and there was also risk of poisoning through lead being carried to the mouth by dirty hands in eating or smoking.

Up to the present there had not been any substitute for white lead in paint which equalled the character and qualities of that metal. The Joint Industrial Council had prepared a set of working regulations for factories engaged in the use of lead paints which prohibited the dry rubbing down of lead paints and specified the provision of washing facilities. The dry method of rubbing down would be replaced by a damp method in which no dust was created. The surface to be rubbed was damped with a sponge, then rubbed with waterproof sand paper, the powdered lead paint being removed from the surface with a wetted sponge. The practicability and efficiency of this method had been generally accepted. The Home Secretary had announced in Parliament that a Bill was under draft prohibiting the use of white lead in the old-fashioned dry form, and which would require all users of lead paints and compounds to use the paste form and to avoid the old-fashioned method of dry rubbing.

A Fluid Synthetic Resin

Produced by the British Cyanides Co.

IN the course of a circular to the shareholders of the British Cyanides Co., Ltd., the secretary states:—

"The continued depression in trade has unfavourably affected the company's normal business, but the savings made in overhead expenses will result in the loss shown on the current year's working being much less than for the previous year.

"The new development mentioned at the last general meeting is progressing rapidly, and the company is now manufacturing from its normal supply of raw material (under provisional patent which has been secured for the process of manufacture) a product claimed to be the first fluid synthetic resin ever offered to the public which is colourless, odourless and transparent. This synthetic resin has many industrial uses, and with a view to securing its immediate sale a new company has been formed called the "Beetle Products Co., Ltd.," which has for its object the purchase of resin from this company and the development of some of the many industrial uses to which it can be put. For one of these uses provisional protection by patent has been obtained and handed over to the Beetle Products Co., Ltd. That company, in which this company retains a substantial interest, has been provided with independent working capital, and the British Cyanides Co. will continue to manufacture the resin and retain the profits derived therefrom.

"A large-scale experiment, whose objective was mechanical operation, has been carried through on the fixation of atmospheric nitrogen, and for several weeks this process ran smoothly and well. Trouble then developed in two of the four retorts, which necessitated the furnace being closed down, and until the pressure of work entailed in the new development referred to above is relieved these experiments will not be resumed."

Memorial to the Late Lord Moulton

A SCHEME has been adopted for the erection of a permanent memorial to the great achievements in the legal and scientific spheres of the late Lord Moulton, and, in particular, his invaluable services to his country in the war. Writing of Lord Moulton's work at the Ministry of Munitions in the preface to his "Life," Lord Birkenhead declares that no man since Bacon brought to the Bar so consummate a scientific equipment, and that on the scientific side his individual contribution to winning the war was as great as that of any contemporary Englishman. The proposal adopted is to associate the memorial with the school at which he began his remarkable career in the realms of mathematics, science, and law. Lord Moulton was one of the most distinguished sons of Kingswood School, Bath, and the scheme comprises the conversion of the main schoolroom into a Lord Moulton Memorial Hall. Plans have been accepted and the cost of the memorial is estimated at £3,500.

The scheme is supported by many influential people, including the Earl of Oxford, Sir John Simon, Mr. Lloyd George, Lord Haldane, Mr. Justice Eve, and Sir Alfred Mond. An appeal has been issued to the many friends of the late Lord Moulton in legal, scientific, and chemical circles, and Mr. Walter Runciman, M.P., 8, Barton Street, Westminster, has consented to act as honorary treasurer.

Dyestuff Licences for April

THE following statement relating to applications for licences under the Dyestuffs (Import Regulation) Act, 1920, made during April has been furnished to the Board of Trade by the Dyestuffs Advisory Licensing Committee:—

The total number of applications received during the month was 505, of which 393 were from merchants or importers. To these should be added 35 cases outstanding on March 31, making a total for the month of 540. These were dealt with as follows:—Granted, 358 (of which 321 were dealt with within seven days of receipt); referred to British makers of similar products, 114 (of which 91 were dealt with within seven days of receipt); referred to Reparation supplies available, 42 (all dealt with within two days of receipt); outstanding on April 30, 26. Of the total of 540 applications received, 454, or 84 per cent., were dealt with within seven days of receipt.

Chemical Matters in Parliament

Indian Coke Production

Mr. Groves (for Mr. Hardie) (House of Commons, May 4) asked the Under-Secretary of State for India the price of coke per ton made in India and what was its volatile content; and whether any of this coke was sent from India, and, if so, to what countries.

Earl Winterton said the prices of coke varied greatly according to quality and locality. Prices at Jharia, an important centre of production, were recently reported as varying from Rs.5½ per ton for second class soft coke to Rs.22 for best hard coke. The volatile content varied greatly, and the information available does not enable any useful statement to be made about it. The average amount exported annually during the three years ending March 31, 1923, was 1,244 tons, which practically all went to Ceylon, the Straits Settlements, Mesopotamia, Persia, and Java.

West African Palm Oil Production

The Secretary of State for the Colonies (House of Commons, May 4), in reply to a question, said that he was awaiting the observations of the Governors of the dependencies concerned upon the Report before coming to any decision in the matter of the Government policy following the publication of the report on the Palm Oil Resources in British West Africa.

British Goods for Sugar-beet Kilns

Mr. Wardlaw-Milne (House of Commons, May 4) asked the Minister of Agriculture whether he would endeavour to induce promoters of new beet-sugar factories to place their orders for fire-brick linings for the lime kilns in sugar-beet factories with British manufacturers.

Mr. Wood said that the attention of the beet-sugar factory companies had been drawn to the point and he was informed that they were using British materials for fire-brick linings.

Alcohol Distillation

Mr. Stephen (for Mr. Hardie) (House of Commons, May 5) asked the Chancellor of the Exchequer the number of distilleries producing alcohol for beverage use only, for industrial uses, and for industrial purposes only.

Mr. Churchill said that present information showed that there were 138 distilleries at work in Great Britain and Northern Ireland. Of these 118 produced alcohol for beverage use only, five for industrial use only, and 15 for both uses.

Methylated Spirits

Mr. Stephen (for Mr. Hardie) (House of Commons, May 5) asked the Chancellor of the Exchequer what was the total sum of money paid in allowances to methylators of power and industrial methylated spirits for the financial year just closed.

Mr. Churchill said that the total amount of allowances paid to methylators in the year ended March 31, 1925, in respect of spirits used for making power and industrial spirits, was £118,759.

Asphalt, Bitumen, and Coal Tar Production

Mr. Clarry (House of Commons, May 5) asked the President of the Board of Trade the total tonnage of bitumen and dehydrated coal tar, respectively, imported or produced in this country during the year 1924.

Mr. Samuel said that the quantity of "asphalt and bitumen" registered as imported into Great Britain and Northern Ireland amounted to 270,051 tons. During 1924 the registered imports of coal tar amounted to 3,065 tons. Complete particulars of the output of coal tar in this country were not available. No bitumen was produced in Great Britain and Northern Ireland.

Canadian Portland Cement Sales

FINAL statistics on cement production as reported by the Mining, Metallurgical, and Chemical Branch of the Dominion Bureau of Statistics at Ottawa show that the sales of Canadian Portland cement in 1924 totalled 7,498,624 barrels, valued at \$13,398,411, as against 7,543,589 barrels, worth \$15,064,661, in the previous twelve months. While cement consumption in Canada during 1924 was 17.3 per cent. less than in 1913, the apparent consumption increased 4.3 per cent. above the total for 1923. Exports of Canadian cement were 153,520 barrels, a decrease of 340,231 barrels from 1923. Importations amounted to 27,672 barrels, an increase of 10,000 barrels over the figures for the previous year.

From Week to Week

THE ADDRESS OF *Drug and Chemical Markets* is now 25, Spruce Street, New York City, as from May 1.

SIR ERNEST RUTHERFORD will visit Australia in September and will deliver three lectures in Melbourne.

THE TOTAL PRODUCTION of bituminous coal and anthracite in the United States during a recent week was 8,894,000 tons.

MR. WILLIAM ROBERT BIRD, of Newport Road, Cardiff, a director of Bird and Son, Ltd., left £16,529 with a net personalty of £14,441.

SIR THOMAS H. HOLLAND, rector of the Imperial College of Science and Technology, South Kensington, has been elected president of the Institution of Mining and Metallurgy.

DR. CLIFFORD M. STUBBS, a Newcastle man, has been appointed Vice President of the West China Union University at which he has been Professor of Chemistry since 1913.

A REQUEST FOR AN INCREASE in the duty on strontium nitrate is now before the United States Tariff Commission. The application was filed by du Pont Co. for an increase in the present rate of 25 per cent. *ad valorem*.

PROFESSOR W. L. BRAGG lectured at the Royal Institution on Friday, May 1. He dealt with the justification for the division of chemical compounds into organic and inorganic substances and showed explanatory experiments.

MR. J. B. SHOESMITH, M.Sc., A.I.C., lecturer in organic chemistry at Edinburgh University, was married to Miss E. L. Hargreaves, of Burnley, last week. Presents were received from the staff and research students and students of different "years," also Sir James Walker, F.R.S.

AT THE RECENT GRADUATION CEREMONY at Glasgow University the following members of the Chemistry Department of the Royal Technical College graduated Doctor of Philosophy (Ph.D.):—A. C. Brown, A. B. Crawford, R. Burns, E. C. Pickering, I. Vance Hopper and J. Ferguson.

A WAREHOUSE FOREMAN, Harvey McLeod, employed by the British Oil Extracting Company at Hull, died in the Infirmary on Tuesday from injuries received while working on the River Hull foreshore on Monday. He was assisting at the loading of a barge when a 6 ft. ball on a crane wire, fell on his head.

PROFESSOR H. A. LORENTZ, of Haarlem, delivered the annual May lecture before the Institute of Metals in London on Wednesday. He dealt with the motion of electricity in metals, touching on Ohm's law, Drude's theory of the conductivity for electricity and for heat, and also the phenomenon of supra-conductivity discovered by Kamerlingh Onnes.

IN THE COMPANIES' WINDING UP COURT on Tuesday, Mr. Justice Eve made an Order for the winding up of the Comet Chemical Co., Ltd. The petition for the winding up was presented by Mr. Alfred White, Pall Mall, Manchester, receiver for the debenture holders in Victors, Ltd. Mr. Romer said it was a judgment creditor's petition, the judgment being for £936.

THE NOVOCRETE AND CEMENT PRODUCTS CO., LTD., has been formed to engage in the manufacture of a new concrete known as "Novocrete," in which mineralised sawdust forms an important ingredient. Although half the weight of ordinary concrete, it can be used for all purposes to which ordinary concrete is applied. It is non-absorbent and fire-resisting, soft and warm to the touch, silent to the tread, and has, says Dr. Faber, the Consulting Engineer to H.M. Office of Works, applications of the first importance in modern industrial requirements.

THE INQUEST on Jeremiah Meggs, works manager of the Government Disinfecting Station, Lodge Lane, held at Liverpool on Monday, was adjourned in order that a microscopical examination might be made regarding the cause of death. In January last deceased was taken home with his nose bleeding profusely. He was in a very weak condition. A witness stated that Meggs told him that they used formaldehyde for destroying anthrax germs in wool and goat hair. It was heated to a high temperature, and gave off a poisonous gas, which gave him headaches and a choking sensation at the back of the throat.

THE ANNUAL MEETING of the members of the Royal Institution was held on Friday, May 1, Sir James Crichton Browne in the chair. The annual report of the committee of visitors for the year 1924 was read and adopted. The report of the Davy Faraday Research Laboratory Committee was also read. Seventy-eight new members were elected in 1924, and 63 lectures and 19 evening discourses were delivered. The following were elected officers for the ensuing year: President, The Duke of Northumberland; Treasurer, Sir James Crichton Browne; Secretary, Sir Arthur Keith; Managers, Sir Thomas Barlow, Sir John Biles, Mr. Sidney G. Brown, Mr. Ernest Clarke, Sir Dugald Clerk, Professor J. A. Fleming, Earl Iveagh, Sir George Lawson Johnston, Sir Oliver Lodge, Mr. Charles H. Merz, Sir Ernest Moon, Sir Charles Parsons, Sir Edward Pollock, Sir Robert Robertson and Sir Almoth Wright. Visitors: Mr. K. A. Wolfe Barry, Mr. Alfred Carpmal, Mr. Edward Dent, Mr. William H. Eccles, Viscount Falmouth, Mr. Frederick H. Glew, Mr. W. E. Lawson Johnston, Mr. Alexander G. Low, Mr. Ronald Malcolm, Mr. Clifford C. Paterson, Sir Walter Peacock, Mr. Herbert M. Phipson, Mr. Hugh Munro Ross, Mr. Frank Coston Taylor, and Mr. John Tennant.

AN HONORARY DEGREE is to be conferred on Sir Ernest Rutherford by the University of Bordeaux.

FOUR LONDON DRIVERS of Allen-Liversidge, Ltd., have received awards from the "Safety First" Council.

MR. P. M. S. BLACKETT, of King's College, Cambridge, has been appointed Assistant Demonstrator of Experimental Physics.

SIR GILBERT WHEATMAN FOX, head of Edward Grey and Co., Ltd., Liverpool, and formerly a director of Lever Bros., Ltd., has left £953,531.

APPLICATIONS ARE INVITED for the post of reader in organic chemistry in the University of the Punjab, Lahore, and should be received by the Joint Registrar before July 31.

WILKINSON AND SIMPSON, manufacturing chemists, of Newcastle, celebrated their business jubilee last week. The business has grown from a small shop to a concern employing nearly 200 workers.

PAINTS AND VARNISHES imported from the United Kingdom to New Zealand during the fourth quarter of last year were valued at £88,734. Imports from the United States were valued at £12,047.

SIR JOHN RUSSELL, F.R.S., director of the Rothamsted Experimental Station, will give a course of lectures on the chemistry, physics and biology of the soil at the Botany School, Cambridge, this term.

AT THE HUXLEY CENTENARY LECTURE by Professor E. B. Poulton at the Royal College of Science, Kensington, on Monday, it was announced that a scheme would no doubt be adopted to provide a permanent memorial to Huxley.

COMA FOLLOWING NITROUS OXIDE GAS POISONING caused the death of Mr. W. J. Moylan Jones, a Golder's Green dentist, who was experimenting last week. He was the inventor of the Moylan dental gas apparatus for administering nitrous oxide.

SIR WILLIAM POPE will lecture on "Faraday as a Chemist" on June 12. This lecture has been arranged by the Royal Institution and will commemorate the hundredth anniversary of Faraday's discovery of benzene that he announced to the Royal Society.

THE FEDERATION OF BRITISH INDUSTRIES, following the findings of a specially appointed committee, has sent a protest to the Mersey Dock and Harbour Board against excessive portage charges and urging substantial reductions at an early date.

A NEW ARMOUR-PIERCING SHELL was mentioned by Sir Robert Hadfield at the annual meeting of Hadfields, Ltd., at Sheffield last week. He said that the shell had been accepted by the Government. He also referred to a new thin armour for which his firm had already received the contract.

A BUILDING AND ALLIED TRADES EXHIBITION, organised by the Birmingham Chamber of Commerce, will be held at Birmingham from September 7 to 19. The schedule includes the following classes:—Ferro-concrete, paints, varnishes, colours, etc., wood preservatives, glues and adhesives, mechanical and hand painting and spraying apparatus.

A CHARGE of being concerned in harbouring uncustomed goods was preferred at Old Street Police Court on Tuesday against A. de Rooy, D. Hartog, M. Van Gigh, and Barnett Gelkoff. It was stated that eleven imported packages which appeared to be rolls of paper contained large quantities of saccharin. The duty in respect of one roll was stated to be £210. A remand was ordered.

REPORTS STATE that the Badische Anilin und Sodafabrik is now operating a new and very cheap method of producing methyl alcohol from water gas. Under the new process the product can be exported to America at 10 cents below the American market price, despite the import duty of 12 cents per gallon. Since the beginning of this year America has delivered about 100,000 gallons of methyl alcohol to Germany, and the new process will probably cause considerable changes in this trade.

THE BALLOT FOR THE ELECTION OF MEMBERS of the Institute of Metals, taken on Monday, resulted in the addition of 53 names to the membership roll. Of these 31 are resident in Great Britain and 22 abroad. The high proportion of foreigners is striking. This brings the Institute's total membership to 1,614, of which 387 members are resident outside the British Isles. A further ballot, particulars of which can be obtained from the Secretary, Mr. G. Shaw Scott, M.Sc., 36, Victoria Street, London, S.W.1, will be held on July 8. Members then elected will be eligible to participate in the Glasgow meeting of the Institute to be held from September 1-4.

AT THE LAST MONTHLY MEETING of the Executive Committee of the Mansion House Association on Railway and Canal Traffic, the supplementary information relating to brake levers on both sides of private owners' waggons required by the Ministry of Transport was considered, together with questions in relation to the Railway Rates Inquiry (Standard Revenue and Standard Charges); Road Transport (London Traffic Act, 1924); New Owners Risk Rates for Perishable Goods by Passenger Train; Claims by Railway Companies; Harbours, Docks and Piers; Split Delivery Charges on Scotch and Irish Traffic by Coastwise Steamers. It was decided to hold the annual meeting on Friday, May 22.

Obituary

MR. A. H. E. ALLHUSEN, of Stoke Poges, whose grandfather, Christian Allhusen, was a well known chemical manufacturer of Newcastle.

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- ACIDS.**—Evolution of the manufacture of sulphuric acid by the chamber process in recent years. Part V. Production and purification of sulphur dioxide. De Jussieu. *L'Ind. Chim.*, April, 1925, pp. 146-151.
- IODOFORM.**—Manufacture of iodoform. J. Frère. *Rev. Prod. Chim.*, March 31, 1925, pp. 181-183.
- AMMONIA OXIDATION.**—Catalytic oxidation of ammonia by air in contact with platinum and palladium alloys. E. Decarriere. *Bull. Soc. Chim.*, March, 1925, pp. 412-421.
- LEUCITE.**—Manufacture of potassium salts, alumina, alum, silica and alkaline silicates from leucite. J. H. Frydender. *Rev. Prod. Chim.*, April 15, 1925, pp. 217-222.
- DEHYDRATION.**—Rates of dehydration in the system water-alumina. M. Guichard. *Bull. Soc. Chim.*, March, 1925, pp. 381-389.
- HYDROCARBONS.**—Production of double acetylenic hydrocarbons. R. Lespieau. *Bull. Soc. Chim.*, March, 1925, pp. 421-425.
- REACTIONS.**—The migratory aptitude of organic radicals. Part II. Comparison of *p*-anisyl and phenyl groups. Tiffeneau and Orékhoft. *Bull. Soc. Chim.*, March, 1925, pp. 430-439.

German

- SCRUBBING.**—A new method of scrubbing gases. G. Weissenberger and F. Schuster. *Z. angew. Chem.*, April 23, 1925, pp. 359-362.
- ETHYLENE.**—The production of ethylene for the preparation of ethylene dibromide by the contact method from alcohol. W. Kesting. *Z. angew. Chem.*, April 23, 1925, pp. 362-363.
- PHOTO-CHEMISTRY.**—The photo-chemistry of complex compounds. Part I. R. Schwarz and H. Weiss. *Ber.*, April 15, 1925, pp. 746-755.
- The chemical action of light on polynitro-toluenes. G. Schultz and K. L. Ganguly. *Ber.*, April 15, 1925, pp. 702-708.
- ANALYSIS.**—The estimation of formaldehyde. E. Schulek. *Ber.*, April 15, 1925, pp. 732-736.
- The titration of alkaloids. H. B. Rasmussen and S. A. Schou. *Z. Elektrochem.*, April, 1925, pp. 189-199.
- The estimation of vanadium. W. Hartmann. *Z. anal. Chem.*, Nos. 1-2, 1925, pp. 16-23.
- New reactions of nitrates and nitrites. S. Vagi. *Z. anal. Chem.*, Part I, Nos. 1-2, 1925, pp. 14-16; Part II, No. 3, 1925, pp. 101-104.
- SUGARS.**—Some derivatives of maltose and glucose. K. Freudenberg, H. v. Hochstetter and H. Engels. *Ber.*, April 15, 1925, pp. 666-671.
- Sulphuric acid compounds of sugars. Part I. H. Ohle and W. Bourjau. *Ber.*, April 15, 1925, pp. 721-723.

Miscellaneous

- OXIDATION.**—Reaction velocity of oxygen with solutions of some inorganic salts. Part III. The catalytic oxidation of sulphites. W. Reinders and S. I. Vles. *Rec. Trav. Chim. Pays-Bas*, April 15, 1925, pp. 249-268.
- HYDROCARBONS.**—The chemical alteration of some gaseous hydrocarbons under the action of radioactive radiation. W. Mund and W. Koch. *Bull. Soc. Chim. Belg.*, February, 1925, pp. 119-126.
- ANALYSIS.**—The estimation of nitrogen in coal, coke and albuminoids. H. ter Meulen. *Rec. Trav. Chim. Pays-Bas*, April 15, 1925, pp. 271-274.

Patent Literature

Abstracts of Complete Specifications

231,555 and 231,574. VAT DYESTUFFS, MANUFACTURE OF. O. Y. Imray, London. From Society of Chemical Industry in Basle, Switzerland. Application dates, November 29 and December 31, 1923.

231,555. A new vat dyestuff is obtained by treating 2-amino-anthraquinone-3-carboxylic acid with fused caustic soda, or with caustic soda heated with an organic flux such as alcohol, paraffin oil, glycerine, aniline, xyldine or anisidine. The product is then purified by treating with strong sulphuric acid, or by treating with an oxidising agent and then with an alkali, or by treating with an alkaline reducing agent and separating the hydro compound. The dyestuff dissolves in concentrated sulphuric acid to an olive solution, and in fuming sulphuric acid to a yellow-brown solution. Water precipitates it from either solution. A blue-black hydrosulphite vat can be obtained which dyes cotton in fast green-blue shades. In an example, 2-amino-anthraquinone-3-carboxylic acid is added at 200°-210° C. to fused caustic alkali, and then heated to 210°-230° C. The mixture is then boiled with water to separate the dyestuff. This product is boiled with dilute nitric acid, which changes the colour from blue black to red brown. The liquid is filtered and the residue washed, boiled with alkali, filtered and washed with water. Examples are also given of the other methods of purification mentioned.

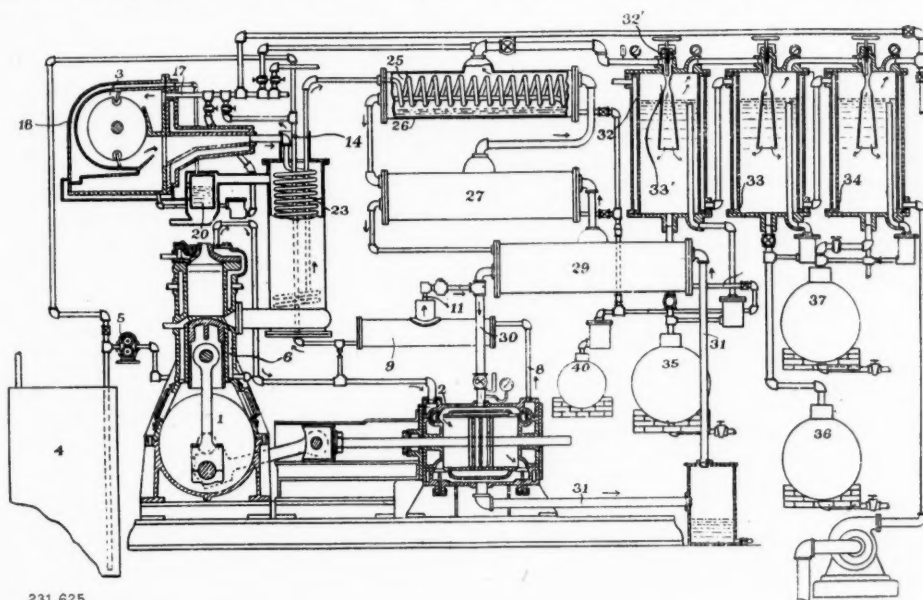
231,574. This is an addition to 231,555. Instead of treating 2-amino-anthraquinone-3-carboxylic acid with a caustic alkali, it is treated with an oxidising agent, and then purified as before. In an example, the acid, or its sodium salt, is added to concentrated sulphuric acid, and then manganese dioxide is added and the mixture heated to 90°-100° C. The liquid is poured into water to precipitate the dyestuff, which is washed, and then boiled with sodium bisulphite and sodium carbonate in succession. The crude product is then purified as in 231,555.

231,564. COLLOIDS, PROCESS FOR HARDENING. A. G. Bloxam, London. From Akt.-Ges. für Anilin Fabrikation, Berlin, S.O. 36. Application date, December 10, 1923.

This may afterwards be immersed in a 0.5 per cent. solution of potassium bichromate which produces a ferric salt and chromic compound, both of which are hardening agents. Several other industrial applications of this process are given.

231,567. BLUE VAT DYESTUFFS. O. Y. Imray, London. From Farbwerke vorm. Meister, Lucius, und Brüning, Höchst-on-Main, Germany. Application date, December 22, 1923.

Dyestuffs obtained by direct halogenation of vat dyestuffs of the thioindigo, indigo, and indigoid series are known to have similar tints to those which are free of halogen. In this invention, the 2:3:2':3'-bis-naphththionaphthene-indigo which gives grey-black tints, as well as the dyestuff of similar composition from 2:3-naphthoxythiophen and reactive α -derivatives of isatin, which dyes grey-black tints, can be transformed by halogenation into vat dyestuffs giving indigo-blue tints. The dyestuffs may be made by (1) halogenating the already formed indigos; (2) condensing suitable components, one or both of which contain halogen, *i.e.*, condensing: (a) halogenated 2:3-naphthoxythiophens with isatins or 2:3-naphthioisatins which do not contain halogen in the nucleus, and which contain in the α -position a reactive group which can be split off, (b) non-halogenated 2:3-naphthoxythiophens with isatins or 2:3-naphththioisatins which contain halogen in the nucleus and which contain in the α -position a reactive group which can be split off, or (c) halogenated 2:3-naphthoxythiophens with isatins or 2:3-naphthioisatins which contain halogen in the nucleus and which contain in the α -position a reactive group which can be split off; (3) condensing the above components and then halogenating the condensation product. These halogenated dyestuffs can also be obtained by starting from the corresponding halogenated parent material, *e.g.* the 1-chloro-2:3-aminonaphthoic acid. An example of the process consists in converting 1-halogen-2-naphthylamine-3-carboxylic acid into 1:2-dihalogen-naphthalene-3-carboxylic acid, and the latter into 1-halogen-2-naphthylthioglycol-3-carboxylic acid which is then condensed to the corresponding oxythionaphthene and oxidised.



231,625

The object is to enable the hardening of gelatine, agar-agar, gum arabic or the like to be controlled, which cannot be done after a hardening agent such as formaldehyde or chrome alum has been added. In this invention, the colloid is mixed with substances which do not act as hardening agents but which can be converted into hardening agents when the colloid is subsequently treated with other substances. Thus, a solution of 10 per cent. of gelatine may be mixed with 0.5 per cent. of ferrous ammonium sulphate, spread on a support, and dried.

231,625. CONVERSION OF HEAVY TO LIGHT HYDROCARBONS. W. E. Shore, 242, Slosson Avenue, Castleton Corners, Staten Island, N.Y., U.S.A. Application date, February 13, 1924.

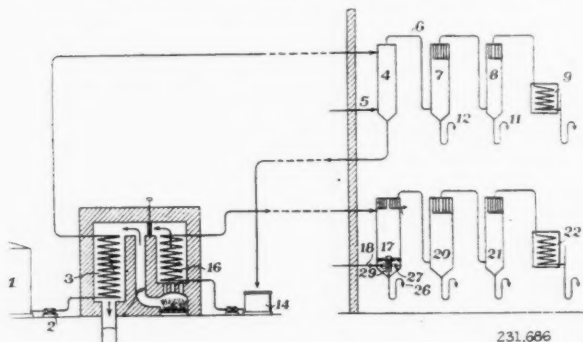
The oil to be treated is contained in a tank 4 and is forced by a pump 5 to the jacket 6 of an oil engine 1, to preheat the oil. The oil then passes through the jacket of a compressor 2 and thence through a pipe 8 to the top of an expansion chamber 9. Any vapour is drawn off through a pipe 11 to the

compressor. The oil passes through a pipe 14 to a high speed atomizer 3, and hydrogen-containing gases may be added through a pipe 17. The highly dispersed oil absorbs hydrogen and becomes converted into lighter oils. The atomizer is provided with a jacket 18 through which mercury vapour is circulated from a heater 20. The atomized mixture passes through a heated pipe coil 23, and thence through a coil 25 in a drum 26. Similar drums 27, 29 may be added in series, and the hot mixture finally passes through a pipe 30 to the compressor cylinder. The entering temperature is about 400° F., and the compressor raises the temperature to 800°-1,200° F., which increases the tendency to hydrogenation. The vaporised mixture then passes through the pipe 31 to the drums 29, 27, 26 to heat the incoming mixture.

The vapour then passes through expansion condensers 32, 33, 34, each containing a hydrocarbon similar to that to be condensed. The vapour in each case passes through an expansion valve such as 32¹ and then through a tube 33¹ into the liquid. The condensates are received in vessels 35, 36, 37. Condensate from the expansion drums 29, 27, 26, is received in a vessel 40. The results obtained are superior to those resulting from cracking processes, and depend on the maintenance of a high speed of movement through the apparatus, the temperature and pressure changes being adiabatic.

231,686. FRACTIONAL DISTILLATION, PROCESS AND APPARATUS FOR. C. H. Borrmann, 16, Semperstrasse, Essen, Germany. Application date, May 2, 1924.

The oil is passed through a succession of heaters, each having a separating device. The crude oil passes from a reservoir 1



through a pump 2 to a preheater 3, and thence to the distillation column 4. Superheated steam is introduced through a pipe 5, and the vaporized light oils pass through a pipe 6 to purifying columns 7, 8 having reflux condensers at their upper parts. Distillates having sharply defined boiling limits are drawn off at 11, 12. The lightest fraction passes to a condenser 9.

Heavy oil and pitch from the column 4 pass to a tank 14 and thence to a heater 16 at a higher temperature. The liquid is atomized in the column 17 and passes down in counter current to superheated steam admitted at 18. Pitch is drawn off at 26, and all heavy oil vapour passes to purifying columns 20, 21, the lighter vapour and water passing on to a condenser 22.

Overheating of the atomized oil in column 17 is avoided by maintaining a body of liquid in the bottom due to the height of the inlet of pipe 26. The steam is admitted through a perforated ring 27 so that it becomes saturated with heavy oil vapour and then has less coking effect on the atomized oil. A liquid separator 31 is arranged in the top of the column. The heaters 3, 16 are heated by gases from the same furnace. Fatty acids, tars, etc., can be separated into their constituents in this apparatus.

231,699. COMPOUNDS OF 4-AMINO-2-ARGENTOMERCAPTOBENZENE-1-CARBOXYLIC ACID AND THEIR ALKALI SALTS, MANUFACTURE OF. W. Carpmæl, London. From Chemische Fabrik auf Actien vorm. E. Schering, 170-1, Mullerstrasse, Berlin. Application date, May 30, 1924.


Specification 201,302 (See THE CHEMICAL AGE, Vol. IX, p. 237) describes the production of 4-amino-2-mercaptobenzene-1-carboxylic acid and alkali salts. These are not readily soluble in water, and in this invention easily soluble salts are obtained by decomposing the free acid or an alkali

salt with sodium formaldehyde-sulphoxylate, or by treating 4-amino-2-mercaptobenzene-1-carboxylic acid with sodium formaldehyde-sulphoxylate, then with a silver salt, and finally transforming into an alkali salt. Some examples are given.

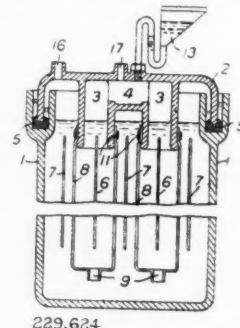
NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention:—207,830 (Deutsche Gold- und Silber-Scheideanstalt vorm. Roessler) relating to manufacture of hydrogen cyanide, see Vol. X., p. 147; 211,108 (Farbenfabriken vorm. F. Bayer and Co.) relating to sulphurised compounds of phenols, see Vol. X., p. 391; 211,145 (Farbwerke vorm. Meister, Lucius, und Brüning) relating to sulpho-benzyl ethers of resinous condensation products derived from phenols, see Vol. X., p. 417; 216,882 (Internationale Bergin Compagnie voor Olieën Kolen-Chemie) relating to production of low-boiling hydrocarbons from hydrocarbons and carbon, see Vol. XI., p. 124; 224,849 (Etablissements Poulsen Frères, E. Fourneau, and J. Trefouel) relating to a symmetrical urea of meta-aminobenzoyl-meta-aminomethylbenzoyl-1-naphthylamino-4 : 6 : 8-trisulphonate of sodium, see Vol. XII., p. 86; 224,223 (Mines Domaniales de Potasse d'Alsace) relating to manufacture of magnesium sulphate from gypsum and dolomite, see Vol. XII., p. 13; 225,513 (Kohlenscheidungs Ges.) relating to low-temperature distillation of bituminous substances, see Vol. XII., p. 116.

International Specifications not yet Accepted

229,624. **ELECTROLYTIC OXYGEN AND HYDROGEN.** Nordiske
Fabriker De-No-Fa Aktieselskap, 14, Kirkegaten, Oslo,
Norway, and C. F. Holmboe,
Villa Polheia, Ris, near Oslo,
Norway. International Con-
vention date, February 19,
1924.



The electrodes 6 are enclosed in diaphragms 8 having small openings 9 at the bottom through which anolyte and catholyte may mix. The diaphragms 8 are secured to depending conduits 3 which communicate with a channel 4. The cover rests on insulators 5, and the joint is hydraulically sealed. Gases from the electrodes 6, 7 are drawn off at the outlets 16, 17.

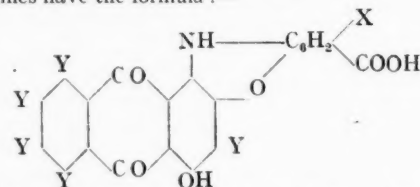


229,640. SODIUM BICARBONATE AND AMMONIUM CHLORIDE.
Ges. für Kohlentechnik, 26, Deutschesstrasse, Eving,
Dortmund, Germany. International Convention date,
February 21, 1924.

Liquor containing ammonium chloride, sodium bicarbonate, sodium chloride, and also a very soluble sodium or ammonium salt such as ammonium nitrate or formate, is treated with carbon dioxide and ammonia. Sodium bicarbonate is precipitated and removed, and the equivalent of finely powdered sodium chloride added. Ammonium chloride is thereby precipitated and removed, leaving a liquor of the same composition as the original. The temperature is maintained at 0° C.

229,668. DYES AND LAKES. Farbenfabriken vorm. F. Bayer and Co., Leverkusen, near Cologne, Germany. International Convention date, February 18, 1924.

Purpuramide or its derivatives are simultaneously oxidised and condensed with an *o*-hydroxy-, *o*-amino-, or *o*-alkylamino-benzoic acid or a derivative having a free *p*-position, and the quinoneimides formed are reduced to anthraquinoneoxazines. The oxazines have the formula:—

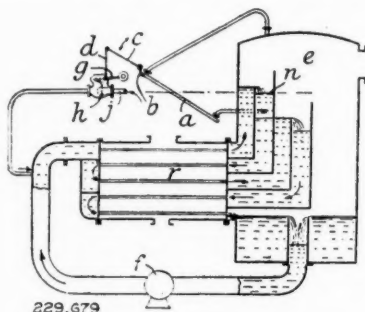


where X is an amino-, alkylamino-, or hydroxyl-group, and Y is hydrogen, halogen, sulpho group, methyl group, etc. These products give blue to green shades on wool. Lakes

are formed with salts of chromium, aluminium, copper, iron, etc. In an example, purpuramide is oxidised and condensed with salicylic acid, cresotinic acid, anthranilic acid, or phenylglycine-*o*-carboxylic acid by means of sulphuric acid and manganese dioxide. The progress of the oxidation is determined by the difference in the absorption spectra. The subsequent reduction is effected with sodium bisulphite.

229,679. EVAPORATING OR DISTILLING APPARATUS. Soc. des Condenseurs Delas, 103, Rue St. Lazare, Paris. International Convention date, February 23, 1924.

The supply of liquid is regulated automatically by a heat-expansive device. Liquid is circulated by a pump *f* through



a heater *r* and then to a vapour separator *e* where it overflows from each compartment to the next. A tube *a* is connected to one of the overflow compartments and is inclined so that it crosses the liquid level *n*. The tube thus contains part liquid and part vapour, and its expansion varies according to the proportions since the temperatures of liquid and vapour are not the same. The expansion of the tube *a* operates the valve *h* to regulate the supply of liquid through the pipe *j* to the apparatus.

LATEST NOTIFICATIONS.

- 232,909. Manufacture of styrol and its homologues. Naugatuck Chemical Co. April 24, 1924.
 232,936. Process for purifying, enriching, or refining crude graphite. Dumond, E. J. E. April 23, 1924.
 232,954. Recovery of oils and the like. Holter, K., and Thune, S. April 22, 1924.
 232,958. Manufacture of colourless compounds containing sulphur and suitable for absorption on textile fibres and other substrata. Akt.-Ges. für Anilin-Fabrikation. April 24, 1924.
 232,963. Method of desulphurising iron. Mathieson Alkali Works. April 23, 1924.

Specifications Accepted with Date of Application

- 206,507. Mercury, Process for producing new organic compounds of. A. Albert. October 31, 1922.
 208,716. Aluminium, Production of. Aluminum Co. of America. December 21, 1922.
 209,754. Petroleum oil, Method of and apparatus for cracking. Power Specialty Co. January 11, 1923. Addition to 179,493.
 211,456. Alloys. E. Conti. February 14, 1923.
 211,487. Hydrocarbons, Process of and apparatus for treating. A. Schwarz. February 13, 1923.
 213,933. Chamber crystals, Process for the production of—on a technical scale. Metal Traders, Ltd. April 7, 1923.
 216,533. Cellulose Manufacture, Process for the production of a half-stuff for. Ges. für Mechanische Zellulose. May 25, 1923.
 217,936. Dyestuffs containing sulphur, Manufacture of. Akt.-Ges. für Anilin Fabrikation. June 23, 1923.
 218,278. Petroleum-like hydrocarbons from fatty acids, glycerides and vegetable and animal oils, Production of. A. Mailhe. June 28, 1923.
 219,327. Hafnium and zirconium, Process for separating. Naamlooze Vennootschap Philips' Gloeilampenfabrieken. July 18, 1923.
 220,591. Rubber latex, Processes for treating. American Rubber Co. August 18, 1923.
 222,836. Hydrofluosilicic acid, Process of producing. A. F. Mayerhofer. October 1, 1923.
 223,808. Fatty acids, Method of manufacturing. A. Welter. October 23, 1923.
 225,546. Gases rich in ethylene, Process for obtaining. H. Suida. November 30, 1923.
 229,282. Phosphorus, phosphorus pentoxide, and phosphoric acid, Process for the production of. Chemische Fabrik Griesheim Elektron. February 11, 1924.
 229,624. Electrolytic apparatus. Nordiske Fabriker De-No-Fa Aktieselskap and C. F. Holmboe. February 19, 1924.
 231,126. Fats and oils, Methods of decolorizing. H. Bollmann. March 24, 1924.
 232,041. Separation of organic compounds from each other. I. Traube. October 15, 1923.
 232,281. Tin from tin bearing materials, Method for extracting or recovering. T. Rondelli. November 15, 1923.
 232,283. Heavy hydrocarbons into gasoline and light hydrocarbons, Converting. F. W. Golby. (Gasoline Products Co., Inc.) December 10, 1923.
 232,347. Mineral oils, Process for distilling and purifying. W. B. Lindsay and W. B. Davidson. January 23, 1924.
 232,358. Coal, peat and other carbonaceous materials, Distillation and carbonisation of. F. M. Perkin and Bettisfield Trust Co., Ltd. January 31, 1924.
 232,361. Crude cotton oils, and the bye-products resulting from their refinement, Treatment of. D. McNicoll. February 6, 1924.
 232,365. Minerals, Machines for heating and drying. R. F. Pochin and H. S. Pochin. February 14, 1924.
 232,392. Hydroxy-benzaldehydes, Manufacture of. British Dyestuffs Corporation, Ltd., and H. H. Hodgson. March 19, 1924.
 232,431. Hydrogen, Process for the production of. Synthetic Ammonia & Nitrates, Ltd. (E. Collett). May 29, 1924.
 232,456. Rotary drums for the distillation of coal and the like. E. C. R. Marks. (Kohlenscheidungs-Ges.). July 11, 1924.
 232,480. Muffle furnaces. Gibbons Bros., Ltd., and M. van Marle. August 22, 1924.
 232,496. Gas producers. Rheinische Metallwaren-und Maschinenfabrik and F. Pacher. September 19, 1924.

Applications for Patents

- Arnold, C., and Dow Chemical Co. Production of anhydrous magnesium chloride. 10,914. April 27.
 Asphalt Cold Mix, Ltd. Bituminous emulsions. 11,266. April 30.
 Badische Anilin- and Soda-Fabrik and Johnson, J. Y. Manufacture of formamide. 11,361. May 1.
 Badische Anilin- and Soda-Fabrik and Johnson, J. Y. Production of stable iron carbonyl compositions. 11,455. 11,456. May 2.
 Bataille, E. Appliance for neutralising and bleaching oils, etc. 11,164. April 29. (France, April 30, 1924.)
 Blicquy, J. de and Callebaut, C. Dyeing silk. 10,979. April 28.
 British Arca Regulators, Ltd. Mixing-valves. 11,398. May 1.
 British Celanese, Ltd., and Ellis, G. H. Treatment of cellulose derivatives. 11,468. May 2.
 Casale, L. Production of urea. 10,943. April 27.
 Cheesman, T. Apparatus for treatment of tar, etc. 11,394. May 1.
 Colloisil Colour Co., Ltd. Production of stable pigment colours. 11,299. April 30.
 Donald, W. Drying, distilling, etc., apparatus. 11,439. May 2.
 Dorr, Co., and Spicer, H. N. Manufacture of aluminium sulphate. 11,060. April 28.
 Farbenfabriken vorm. F. Bayer and Co. Process for spinning threads from acidyl cellulose. 11,054. April 28. (Germany, April 29, 1924.)
 Farbwerke vorm. Meister, Lucius, and Brüning, and Imray, O. Y. Manufacture of vat dyestuffs. 11,079. April 28.
 Guggenheim Bros. Metallurgical processes. 11,154. April 29. (United States, June 7, 1924.)
 Harris, J. E. G., Scottish Dyes, Ltd., Thomas, J., and Wylam, B. Dyes and dyeing. 11,297. April 30.
 Harris, J. E. G., Scottish Dyes, Ltd., Thomas, J., and Wylam, B. Dyes and dyeing. 11,376. May 1.
 Karpen and Bros., S. Production of chlor-derivatives of methane. 10,949. April 27.
 Ormandy, W. R., and Peake, A. M. Treatment of leucite, etc. 11,162. April 29.
 Pease, E. L. Manufacture of phosphoric acid or phosphatic fertilisers. 11,171. April 29.
 Rhodin, B. E. F. Extraction of magnesium from alloys, etc. 10,930. April 27. (United States, May 13, 1924.)
 Scottish Dyes, Ltd., Smith, W., and Thomas, J. Production of colouring-matters. 10,920. April 27.
 Steffen, C. Processes for obtaining tricalcium saccharate. 10,910. April 27.
 Viscose Co. and Johnson, J. Y. Recovery of caustic hydroxides from solutions. 10,906. April 27. (October 23, 1924.)

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, May 8, 1925.

TRADE has certainly been brighter during the past week, although demand is still far below normal. Prices on the whole are well maintained, and stocks of most commodities are exceptionally light. Export market is without special feature.

General Chemicals

ACETONE is in steady demand at £75 to £76 per ton, ex wharf. ACID, ACETIC is a quiet market. Price unchanged at £39 per ton for technical 80%, and £40 per ton for pure 80%.

ACID, CITRIC is a very quiet market. Price is nominally 1s. 5d. per lb.

ACID, FORMIC is quietly steady, at about £50 for 80% by weight.

ACID, LACTIC is in fair demand, stocks are firmly held at £43 per ton for 50%.

ACID, OXALIC is in fair demand, and as the second-hand stocks are exhausted, the market is slowly improving. Price to-day is 3½d. per lb.

ACID, TARTARIC is in very poor demand. Buying is principally from hand to mouth. Price is about 11½d. per lb.

ALUMINA SULPHATE is uninteresting. Price unchanged.

ARSENIC. The break in the market caused by Japanese realisation has been fully discounted, and the price has reacted from the worst. Price, however, is so nominal that no market quotation can usefully be given.

BARIUM CHLORIDE is in fair demand, at about £11 per ton, ex wharf.

CREAM OF TARTAR is active at £75 to £77 per ton, according to make.

EPSOM SALTS is unchanged.

FORMALDEHYDE is steady, although the demand leaves much to be desired. Price varies between £40 and £42 per ton.

LEAD ACETATE is in good demand, with white at £45 to £46 per ton, and brown £43 to £44 per ton.

LIME ACETATE is uninteresting.

METHYL ALCOHOL is higher in price. The cheap parcels which have been disturbing the market have disappeared. Price to-day is £48 to £50 per ton.

POTASSIUM CHLORATE remains scarce, and is quoted 4d. to 4½d. per lb.

POTASH PRUSSATE is in fair demand at 7½d. per lb.

SODA ACETATE is lifeless. Quotations vary from £20 10s. to £22 per ton.

SODIUM BICHROMATE is unchanged.

SODA HYPOSULPHITE is very quiet, with price nominally unchanged.

SODA PRUSSATE.—There is still considerable export inquiry, and the price is 4½d. per lb., and seems likely to improve.

SODA NITRITE is in steady demand at £22 10s. to £23 per ton, ex wharf.

SODA SULPHIDE.—The tendency remains in buyers' favour. Continental competition remaining very keen.

ZINC SULPHATE is unchanged.

Coal Tar Products

There is no change to report in the market for coal tar products from last week.

BENZOL, 90%, remains firm at 1s. 9d. to 1s. 9½d. per gallon, on rails.

PURE BENZOL is offered at 1s. 11d. to 2s. per gallon on rails.

CREOSOTE OIL is steady at 5½d. to 6d. per gallon on rails in the North, and 7d. to 7½d. per gallon in London.

CRESYLIC ACID is in poor demand, and is quoted at 1s. 8d. to 1s. 9d. per gallon on rails in bulk for the pale quality, 97/99%, while the dark quality, 95/97%, is quoted at 1s. 6½d. to 1s. 7d. per gallon on rails.

SOLVENT NAPHTHA remains unchanged at 1s. 3½d. per gallon on rails.

HEAVY NAPHTHA is also unchanged at 1s. 1d. to 1s. 2d. per gallon on rails.

NAPHTHALENES remain stationary, at about £3 15s. to £4 5s. per ton for the lower qualities, while 74/76° quality is quoted at £5 to £5 10s. per ton, and 76/78° at £6 to £6 10s. per ton.

PITCH is dull, and owing to the lateness of the season, there is very little demand for prompt shipment. To-day's values are approximately 40s. to 42s. 6d. per ton, f.o.b. main U.K. ports. For forward shipment manufacturers are asking a premium of about 2s. 6d. per ton, but consumers are not willing to pay the higher price, and consequently very little business is transacted.

Latest Oil Prices

LONDON.—LINSEED OIL firm, and 2s. 6d. to 7s. 6d. higher. Spot, £45; May, £44 2s. 6d.; May-August, £44 5s.; September-December, £44 2s. 6d. RAPE OIL quiet. Crude crushed, £49; technical refined, £52. COTTON OIL steady. Refined common edible, £47; deodorised, £43 10s.; Egyptian crude, £41 10s. TURPENTINE strong and active at 4s. 9d. to 1s. 9d. over last rates. American, spot, 76s. 9d. paid; 77s., sellers; May, 72s. 6d., paid; 73s., sellers; and July-December, 67s. 3d., sellers.

HULL.—LINSEED OIL, spot to May-August, £44; September-December, £43 15s. COTTON OIL: Bombay, crude, £38 5s.; Egyptian, crude, £40; edible refined, £44; deodorised, £46; technical, £41 10s. PALM KERNEL OIL: Crushed, naked, £41 10s. GROUNDNUT OIL: Crushed-extracted, £47; deodorised, £51. SOYA OIL: Extracted and crushed, £40 10s.; deodorised, £48. RAPE OIL: Extracted, £48 5s. per ton, net, cash terms, ex mill. CASTOR OIL and COD OIL unchanged.

Nitrogen Products Market

Export.—The demand for export has continued quiet during the early days of May. This is a regular seasonal happening, as consumption is at its height during April, and export prices are normally reduced by the end of May. The British producers are quoting £13 5s. per ton f.o.b. for prompt shipment and £12 5s. per ton f.o.b. for June shipment. It is probable that sales for shipment end May will be made at some figure between these two. It seems clear that there will be a large production of sulphate to dispose of from June onwards, and it is probable that when the time comes the present quotation will be lowered somewhat. German prices for Continental countries are slightly below this figure.

Home.—The home demand continues brisk, although there are the usual signs of falling off when May is reached. The season is a later one than last year, and it is anticipated when it closes on the 31st instant, that when all the figures are in an advance will be shown on last year's sales. The present price of £14 14s. per ton for neutral quality basis 21.1 per cent. nitrogen, delivered to consumer's station, will remain in force until the end of May. It is not yet known whether the producers will fix the same price for June and start the new season on July 1st, or whether this price will be reduced at the end of the month.

Nitrate of Soda.—The nitrate market is firmer. Sales c.i.f. were made during the week at £11 13s. 6d. There have been large movements from the hands of dealers to consumers, and it appears that the stocks of nitrate carried over will be smaller than formerly expected. The nitrate producers have not yet fixed their price for next season. Opinion in many quarters seems to take the view that the scale will be much the same as last year, but we are inclined to think that the scale will be a lower one.

Chemical Salts

PRECIOUS metals and chemical salts form the subject of a new catalogue from Johnson, Matthey and Co., Ltd., 78/82, Hatton Garden, London, E.C.1. The lists cover the materials in which the firm deals, with special reference to the chemical salts prepared and sold by them. The items are well tabulated and symbols and formulæ always included. Fees for assays and analyses are listed and a section deals with fluorescent screens for X-ray work.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at retailers' works.

General Heavy Chemicals

Acid Acetic, 40% Tech.—£21 to £23 per ton.
 Acid Boric, Commercial.—Prices reduced by £5 per ton. Crystal, £40 per ton, Powder, £42 per ton.
 Acid Hydrochloric.—3s. 9d. to 6s. per carboy d/d., according to purity, strength and locality.
 Acid Nitric, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.
 Acid Sulphuric.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 65s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
 Ammonia Alkali.—£6 15s. per ton f.o.r. Special terms for contracts.
 Bleaching Powder.—Spot, £10 10s. d/d; Contract, £10 d/d. 4 ton lots.
 Bisulphite of Lime.—£7 10s. per ton, packages extra, returnable.
 Borax, Commercial.—Crystal, £25 per ton. Powder, £26 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)
 Calcium Chlorate (Solid).—£5 12s. 6d. to £5 17s. 6d. per ton d/d, carriage paid.
 Copper Sulphate.—£25 to £25 10s. per ton.
 Methylated Spirit 64 O.P.—Industrial, 2s. 7d. to 2s. 11d. per gall. Mineralised, 3s. 8d. to 4s. per gall., in each case according to quantity.
 Nickel Sulphate.—£38 per ton d/d. Normal business.
 Nickel Ammonia Sulphate.—£38 per ton d/d. Normal business.
 Potash Caustic.—£30 to £33 per ton.
 Potassium Bichromate.—5d. per lb.
 Potassium Chlorate.—2½d. to 3d. per lb.
 Salammoniac.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton. Carr. pd.
 Salt Cake.—£3 15s. to £4 per ton d/d. In bulk.
 Soda Caustic, Solid.—Spot lots delivered, £15 12s. 6d. to £18 per ton, according to strength: 20s. less for contracts.
 Soda Crystals.—£5 to £5 5s. per ton ex railway depots or ports.
 Sodium Acetate 97/98%.—£24 per ton.
 Sodium Bicarbonate.—£10 10s. per ton, carr. paid.
 Sodium Bichromate.—4d. per lb.
 Sodium Bisulphite Powder 60/62%.—£16 to £17 per ton, according to quantity, f.o.b., 1-cwt. iron drums included.
 Sodium Chlorate.—2½d. per lb.
 Sodium Nitrate refined 96%.—£13 5s. to £13 10s. per ton, ex Liverpool. Nominal.
 Sodium Nitrite 100% basis.—£27 per ton d/d.
 Sodium Sulphate (Glauber Salts).—£3 12s. 6d. per ton.
 Sodium Sulphide conc. solid. 60/65.—About £15 per ton d/d. Contract £14 15s. Carr. pd.
 Sodium Sulphide Crystals.—£9 5s. per ton d/d. Contract £9 2s. 6d. Carr. pd.
 Sodium Sulphide, Pea Crystals.—£15 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

Acid Carbolic Crystals.—5d. per lb. Quiet demand. Crude 60's, 1s. 6d. per gall. Little demand.
 Acid Cresylic 97/99.—1s. 8d. to 2s. per gall. Fair business.
 Pale, 95%, 1s. 6d. to 1s. 10d. per gall. Dark, 1s. 6d. to 1s. 9d. per gall. Little demand.
 Anthracene Paste 40%.—3d. to 4d. per unit per cwt.—Nominal price. No business.
 Anthracene Oil, Strained.—7d. to 8d. per gall. Unstrained, 6d. to 7d. per gall.
 Benzol.—Crude 65's.—9d. to 11½d. per gall., ex works in tank wagons. Standard Motor, 1s. 4½d. to 1s. 6d. per gall., ex works in tank wagons. Pure, 1s. 9½d. to 1s. 11d. per gall., ex works in tank wagons.
 Toluol.—90%.—1s. 7d. to 1s. 8d. per gall. More inquiry. Pure, 1s. 10d. to 2s. per gall. Steady demand.
 Xylol Commercial.—2s. 3d. per gall. Pure, 3s. 3d. per gall.
 Creosote.—Cresylic, 20/24%.—8d. to 8½d. per gall. Little demand.
 Middle Oil, Heavy, Standard specification, 6d. to 7d. per gall., according to quality and district. More inquiry.
 Naphtha.—Crude, 8d. to 9d. per gall. Solvent 90/160, 1s. 4d. to 1s. 6d. per gall. Demand good. Solvent 90/190, 11½d. to 1s. 1d. per gall. Steady business.
 Naphthalene Crude.—Cheaper in Yorkshire than in Lancashire. Drained Creosote Salts, £3 to £5 per ton. Demand falling off. Whizzed or hot pressed. £6 to £9 per ton.
 Naphthalene.—Crystals and Flaked, £12 to £15 per ton, according to districts. Very quiet.
 Pitch.—Medium soft, 37s. 6d. to 42s. 6d. per ton, according to district. More inquiry for next season. Few sellers.
 Pyridine.—90/160, 19s. to 19s. 6d. per gall. Market more active. Fair demand. Heavy, 11s. 6d. to 12s. per gall. More inquiry.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated.

Acetic Anhydride 95%.—1s. 7d. per lb.
 Acid H.—3s. 9d. per lb. 100% basis d/d.
 Acid Naphthionic.—2s. 2d. per lb. 100% basis d/d.
 Acid Neville and Winther.—5s. 8d. per lb. 100% basis d/d.
 Acid Salicylic, technical.—11½d. to 1s. per lb. Price reduced. Improved demand.
 Acid Sulphanilic.—9d. per lb. 100% basis d/d.
 Aluminium Chloride, anhydrous.—10d. per lb. d/d.
 Aniline Oil.—7½d. per lb. naked at works.
 Aniline Salts.—8d. per lb. naked at works.
 Antimony Pentachloride.—1s. per lb. d/d.
 Benzidine Base.—3s. 8d. per lb. 100% basis d/d.
 Benzyl Chloride 95%.—1s. 1d. per lb.
 p-Chlorophenol.—4s. 3d. per lb. d/d.
 p-Chloraniline.—3s. per lb. 100% basis.
 o-Cresol 29/31° C.—3d. per lb. Demand quiet.
 m-Cresol 98/100%.—2s. 1d. to 2s. 3d. per lb. Demand moderate.
 p-Cresol 32/34° C.—2s. 1d. to 2s. 3d. per lb. Demand moderate.
 Dichloraniline.—2s. 3d. per lb.
 Dichloraniline S. Acid.—2s. 3d. per lb. 100% basis.
 p-Dichlorbenzol.—£85 per ton.
 Diethylaniline.—4s. 3d. per lb. d/d., packages extra, returnable.
 Dimethylaniline.—2s. 2d. per lb. d/d. Drums extra.
 Dinitrobenzene.—9d. per lb. naked at works.
 Dinitrochlorbenzol.—£84 10s. per ton d/d.
 Dinitrotoluene.—48/50° C. 8d. to 9d. per lb. naked at works. 66/68° C. 1s. per lb. naked at works.
 Diphenylaniline.—2s. 10d. per lb. d/d.
 G. Salt.—2s. 2d. per lb. 100% basis d/d.
 Monochlorbenzol.—£63 per ton.
 a-Naphthol.—2s. 3d. per lb. d/d.
 B-Naphthol.—1s. per lb. d/d.
 a-Naphthylamine.—1s. 3½d. per lb. d/d.
 B-Naphthylamine.—3s. 9d. per lb. d/d.
 m-Nitraniline.—4s. 2d. per lb. d/d.
 p-Nitraniline.—2s. 2d. per lb. d/d.
 Nitrobenzene.—5½d. to 5½d. per lb. naked at works.
 o-Nitrochlorbenzol.—2s. 3d. per lb. 100% basis d/d.
 Nitronaphthalene.—10d. per lb. d/d.
 p-Nitrophenol.—1s. 9d. per lb. 100% basis d/d.
 p-Nitro-o-amido-phenol.—4s. 6d. per lb. 100% basis.
 m-Phenylene Diamine.—4s. per lb. d/d.
 p-Phenylene Diamine.—9s. 9d. per lb. 100% basis d/d.
 R. Salt.—2s. 4d. per lb. 100% basis d/d.
 Sodium Naphthionate.—2s. 2d. per lb. 100% basis d/d.
 o-Toluidine.—10d. per lb.
 p-Toluidine.—2s. 3d. per lb. naked at works.
 m-Tolylene Diamine.—4s. per lb. d/d.

Wood Distillation Products

Acetate of Lime.—Brown £11. Quiet market. Grey, £15 10s. per ton. Firmer. Liquor, 9d. per gall. 32° Tw.
 Acetone.—£78 per ton.
 Charcoal.—£7 5s. to £9 per ton, according to grade and locality. Fair demand.
 Iron Liquor.—1s. 7d. per gall 32° Tw. 1s. 2d. per gall. 24° Tw.
 Red Liquor.—10d. to 1s. per gall. 14/15° Tw.
 Wood Creosote.—2s. 9d. per gall. Unrefined.
 Wood Naphtha, Miscible.—4s. 9d. per gall. Only moderate market.
 60% O.P. Solvent, 5s. per gall. 40% O.P.
 Wood Tar.—£4 to £5 per ton. Demand slack and stocks being held.
 Brown Sugar of Lead.—£43 10s. per ton.

Rubber Chemicals

Antimony Sulphide.—Golden, 7½d. to 1s. 5d. per lb., according to quality. Crimson, 1s. 5d. to 1s. 7½d. per lb., according to quality.
 Arsenic Sulphide, Yellow.—2s. per lb.
 Cadmium Sulphide.—4s. 4d. per lb., according to quantity.
 Carbon Bisulphide.—£32 to £35 per ton, according to quantity.
 Carbon Black.—6d. to 6½d. per lb., ex wharf.
 Carbon Tetrachloride.—£62 to £67 per ton, according to quantity, drums extra.
 Chromium Oxide, Green.—1s. 4d. per lb.
 Indiarubber Substitutes, White and Dark.—5½d. to 7½d. per lb.
 Lamp Black.—£48 per ton, barrels free.
 Lead Hyposulphite.—9d. per lb.
 Lithopone, 30%.—£22 10s. per ton.
 Mineral Rubber "Rubpron".—£16 to £18 per ton f.o.r. London.
 Sulphur.—£10 to £12 per ton, according to quality.
 Sulphur Chloride.—4d. per lb., carboys extra.

Sulphur Precip. B.P.—£56 to £65 per ton.
 Thiocarbamide.—2s. 6d. per lb.
 Vermilion, Pale or Deep.—5s. 6d. per lb. Dearer.
 Zinc Sulphide.—1s. 1d. per lb.

Pharmaceutical and Photographic Chemicals

Acid, Acetic 80% B.P.—£41 per ton ex wharf London in glass containers.
 Acid, Acetyl Salicylic.—2s. 9d. to 3s. per lb., according to quantity. Market slightly easier.
 Acid, Benzoic B.P.—2s. to 2s. 3d. per lb., according to quantity.
 Acid, Boric B.P.—Prices reduced by £5 per ton. Crystal £46 per ton, Powder £50 per ton. Carriage paid any station in Great Britain.
 Acid, Camphoric.—19s. to 21s. per lb.
 Acid, Citric.—1s. 5d. per lb., less 5% for ton lots. Slightly upward tendency.
 Acid, Gallic.—2s. 9d. per lb. for pure crystal, in cwt. lots. Easier.
 Acid, Pyrogallie, Crystals.—6s. per lb. for 1 cwt. lots. 7s. 6d. per lb. for 7-lb. lots, according to quantity. Steady market.
 Acid, Salicylic.—1s. 5d. to 1s. 6d. per lb., according to quantity. Market rather easier.
 Acid, Tannic B.P.—2s. 9d. per lb. Quiet steady demand.
 Acid, Tartaric.—1s. 1d. per lb., less 5%. Very firm. Demand good.
 Amidol.—9s. per lb., d/d.
 Acetanilide.—1s. 9d. per lb. Price lower owing to competition
 Amidopyrin.—14s. per lb.
 Ammonium Benzoate.—3s. to 3s. 6d. per lb., according to quantity.
 Ammonium Carbonate B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks.
 Atropine Sulphate.—12s. 6d. per oz. for English make.
 Barbitone.—11s. 9d. per lb. Price lower owing to competition.
 Benzonaphthol.—4s. 3d. per lb. spot. Weaker. Demand quiet.
 Bismuth Salts.—Prices reduced by about 1s. 3d. to 2s. 3d. per lb. on account of the fall in the price of the metal.
 Bismuth Carbonate.—10s. 6d. to 12s. 6d. per lb.
 Bismuth Citrate.—10s. 3d. to 12s. 3d. per lb.
 Bismuth Salicylate.—9s. to 11s. per lb.
 Bismuth Subnitrate.—8s. 8d. to 10s. 8d. per lb. according to quantity.
 Borax B.P.—Crystal £29, Powder £30 per ton. Carriage paid any station in Great Britain.
 Bromides.—Potassium, 1s. 11d. to 2s. 1d. per lb.; sodium, 2s. to 2s. 2d. per lb.; ammonium, 2s. 4d. to 2s. 6d. per lb., all spot. Much firmer. Forward prices higher.
 Calcium Lactate.—1s. 6½d. to 1s. 10d., according to quantity. Fair demand and steady market.
 Chloral Hydrate.—3s. 8d. per lb., duty paid.
 Chloroform.—2s. 6d. per lb. for cwt. lots.
 Creosote Carbonate.—6s. 9d. per lb. Little demand.
 Formaldehyde.—£41 per ton, in barrels ex wharf.
 Glycerophosphates.—Fair business passing. Calcium, soluble and citrate free, 7s. per lb.; iron, 8s. 9d. per lb.; magnesium, 9s. per lb.; potassium, 50%, 3s. 6d. per lb.; sodium, 60%, 2s. 6d. per lb.
 Guaiacol Carbonate.—7s. 6d. per lb.
 Hexamine.—2s. 7d. per lb. for cwt. lots.
 Homatropine Hydrobromide.—25s. to 30s. per oz.
 Hydrastine Hydrochloride.—English make offered at 120s. per oz.
 Hydrogen Peroxide (12 vols.).—1s. 8d. per gallon f.o.r. makers' works, naked.
 Hydroquinone.—4s. 3d. per lb. Nominal.
 Hypophosphites.—Calcium, 3s. 6d. per lb., for 28 lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
 Iron Ammonium Citrate B.P.—1s. 11d. to 2s. 3d. per lb.
 Magnesium Carbonate.—Light Commercial, £36 per ton net. Light pure, £46 per ton.
 Magnesium Oxide.—Light Commercial, £72 10s. per ton, less 2½%, price reduced; Heavy Commercial, £25 per ton, less 2½%; Heavy Pure, 2s. to 2s. 3d. per lb., according to quantity.
 Menthol.—A.B.R. recrystallised B.P., 44s. per lb.; April delivery. Synthetic 26s. to 31s. per lb., according to quality. English make. Increasing demand.
 Mercurials.—Market flat. Mercury slightly firmer. Red oxide, 5s. 2d. to 5s. 4d. per lb.; Corrosive sublimate, 3s. 7d. to 3s. 9d. per lb.; white precipitate, 4s. 6d. to 4s. 8d. per lb.; Calomel, 3s. 10d. to 4s. per lb.
 Methyl Salicylate.—1s. 5½d. per lb., for ton lots. Keen competition.
 Methyl Sulphonol.—18s. 6d. per lb. Cheaper.
 Metol.—11s. per lb. British make.
 Morphone and Salts.—Reduced by 1s. to 1s. 3d. per oz.
 Paraformaldehyde.—2s. 2d. for B.P. quality. Keen competition has brought prices down.
 Paraldehyde.—1s. 2d. to 1s. 4½d. per lb., in free bottles and cases.
 Phenacetin.—4s. 8d. per lb. in cwt. lots. Unsettled. Supplies exceed demand.
 Phenazone.—6s. 3d. to 6s. 6d. per lb. Spot price lower than forward.
 Phenolphthalein.—4s. 6d. to 5s. per lb. for cwt. lots.
 Potassium Bitartrate 99/100% (Cream of Tartar).—83s. per cwt., less 2½% for ton lots.
 Potassium Citrate.—1s. 10d. to 2s. 2d. per lb.
 Potassium Ferricyanide.—1s. 9d. per lb. Quiet.
 Potassium Iodide.—16s. 8d. to 17s. 5d. per lb., according to quantity. Steady market.

Potassium Metabisulphite.—7½d. per lb., 1-cwt. kegs included. f.o.r. London.
 Potassium Permanganate.—B.P. crystals, 7½d. per lb., spot; commercial, 8d. to 8½d. per lb., carriage paid. Slight reaction after recent advance.
 Quinine Sulphate.—2s. 3d. to 2s. 4d. per oz., in 100 oz. tins. Steady market.
 Resorcin.—4s. 9d. per lb. In fair quantities. Supplies exceed demand.
 Saccharin.—63s. per lb. in 50 lb. lots.
 Salol.—3s. 6d. per lb., for cwt. lots. Slightly dearer.
 Silver Proteinate.—12s. per lb. for satisfactory product light in colour.
 Sodium Benzoate, B.P.—1s. 10d. to 2s. 2d. per lb. From natural benzoic acid. Supplies of good quality available.
 Sodium Citrate, B.P.C., 1923.—1s. 11d. to 2s. 2d. per lb., according to quantity.
 Sodium Hyposulphite, Photographic.—£14 to £15 per ton, according to quantity, d/d consignee's station in 1-cwt. kegs.
 Sodium Metabisulphite Crystals.—37s. 6d. to 60s. per cwt., net cash, according to quantity.
 Sodium Nitroprusside.—16s. per lb.
 Sodium Potassium Tartrate (Rochelle Salt).—75s. per cwt., for ton lots and upwards.
 Sodium Sulphate.—Powder, 2s. 2d. to 2s. 3d. per lb. Crystal, 2s. 3d. to 2s. 5d. per lb. Flake, 2s. 6d. per lb. Strong demand, market firmer.
 Sodium Sulphide, pure recrystallised.—10d. to 1s. 2d. per lb.
 Sodium Sulphite, anhydrous, £27 10s. per ton, minimum 5 ton lots, according to quantity; 1-cwt. kegs included.
 Sulphonol.—13s. per lb. accepted for quantity.
 Thymol.—16s. per lb.

Perfumery Chemicals

Acetophenone.—10s. 9d. per lb.
 Aubepine.—11s. 3d. per lb.
 Amyl Acetate.—3s. per lb.
 Amyl Butyrate.—6s. 6d. per lb.
 Amyl Salicylate.—3s. 1½d. per lb.
 Anethol (M.P. 21/22° C.).—4s. 6d. per lb.
 Anethol Acetate from Chlorine-free Benzyl Alcohol.—2s. 7½d. per lb.
 Benzyl Alcohol free from Chlorine.—2s. 7½d. per lb.
 Benzaldehyde free from Chlorine.—3s. 1½d. per lb.
 Benzyl Benzoate.—3s. 1½d. per lb.
 Cinnamic Aldehyde Natural.—16s. per lb.
 Coumarin.—14s. 9d. per lb.
 Citronellol.—22s. per lb.
 Citral.—10s. per lb.
 Ethyl Cinnamate.—10s. per lb.
 Ethyl Phthalate.—3s. per lb.
 Eugenol.—10s. 6d. per lb.
 Geraniol (Palmarosa).—28s. 6d. per lb.
 Geraniol.—9s. 6d. to 18s. 6d. per lb.
 Heliotropine.—6s. 3d. per lb.
 Iso Eugenol.—15s. per lb.
 Linalol ex Bois de Rose.—24s. 6d. per lb.
 Linalyl Acetate.—24s. 6d. per lb.
 Methyl Anthranilate.—10s. per lb.
 Methyl Benzoate.—5s. per lb.
 Musk Ambrette.—50s. per lb.
 Musk Ketone.—42s. 6d. per lb.
 Musk Xylol.—11s. per lb.
 Nerolin.—4s. 6d. per lb.
 Phenyl Ethyl Acetate.—15s. per lb.
 Phenyl Ethyl Alcohol.—14s. per lb.
 Rhodinol.—40s. per lb.
 Safrinol.—1s. 8d. per lb.
 Terpeneol.—1s. 10d. per lb.
 Vanillin.—25s. to 25s. 6d. per lb.

Essential Oils

Almond Oil, Foreign S.P.A.—13s. 9d. per lb.
 Anise Oil.—2s. 9d. per lb.
 Bergamot Oil.—16s. per lb.
 Bourbon Geranium Oil.—22s. 6d. per lb.
 Camphor Oil.—62s. 6d. per cwt.
 Cananga Oil, Java.—11s. per lb.
 Cinnamon Oil, Leaf.—6d. per oz.
 Cassia Oil, 80/85%.—10s. per lb.
 Citronella Oil.—Java, 85/90%, 4s. 10d. per lb. Ceylon, 2s. 3½d. to 2s. 11d. per lb., according to quality.
 Clove Oil.—7s. 6d. per lb.
 Eucalyptus Oil, 70/75%.—2s. per lb.
 Lavender Oil.—French 38/40% Esters, 35s. per lb.
 Lemon Oil.—3s. 9d. per lb.
 Lemongrass Oil.—5s. 9d. per lb.
 Orange Oil, Sweet.—11s. 3d. per lb.
 Palma Rose Oil.—15s. 3d. per lb.
 Otto of Rose Oil.—Bulgarian, 42s. 6d. per oz. Anatolian, 28s. per oz.
 Palma Rose Oil.—16s. 9d. per lb.
 Peppermint Oil.—Wayne County, 65s. per lb. Japanese, 17s. 3d. per lb.
 Petitgrain Oil.—9s. 9d. per lb.
 Sandal Wood Oil.—Mysore, 26s. 7d. per lb. Australian, 18s. 6d. per lb.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, May 8, 1925.

DURING the past week business in heavy chemicals has been moderately good, although inquiry for export was somewhat disappointing. Prices generally are unchanged.

Industrial Chemicals

ACID ACETIC.—In moderate demand, and prices unchanged. 98/100% Glacial, £56 to £67 per ton according to quality and packing, c.i.f. U.K. ports. 80% Pure, £40 to £42 per ton. 80% Technical, £39 to £41 per ton, packed in casks c.i.f. U.K. ports.

ACID BORIC.—Crystal, granulated or small flaked £40 per ton. Powdered, £42 per ton, packed in bags, carriage paid U.K. stations, minimum ton lots.

ACID CARBOLIC ICE CRYSTALS.—Quoted 5d. per lb., delivered. In little demand.

ACID CITRIC B.P. CRYSTALS.—Unchanged at about 1s. 4½d. per lb., less 5%, ex store, spot delivery. In usual steady demand.

ACID FORMIC 85%.—Spot material quoted £49 10s. per ton, ex store. Offered from the Continent at about £48 5s. per ton, ex wharf.

ACID HYDROCHLORIC.—In little demand. Price 6s. 6d. per carboy, ex works.

ACID NITRIC 80%.—Usual steady demand quoted £23 15s. per ton, ex station full truck loads.

ACID OXALIC 98/100%.—In moderate demand. Quoted for prompt shipment from the Continent at about 3½d. per lb., ex wharf. Spot material on offer at 3½d. per lb., ex store.

ACID SULPHURIC.—144°, £3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC B.P. CRYSTALS.—Good inquiry. Spot lots now quoted 1s. per lb., less 5% ex store. Offered for prompt shipment from the Continent at 11½d. per lb., less 5% ex wharf.

ALUMINA SULPHATE, 17/18% IRON FREE.—Quoted £6 15s. per ton, ex store, spot delivery. Offered for prompt shipment from the Continent at about £6 5s. per ton c.i.f. U.K. ports.

ALUM LUMP POTASH.—Spot material now quoted £9 5s. per ton, ex store. Offered for prompt shipment from the Continent at about £8 2s. 6d. c.i.f. U.K. ports.

AMMONIA ANHYDROUS.—Quoted 1s. 4½d. per lb., ex station. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton. Powdered, £39 per ton. Packed in 5 cwt. casks delivered U.K. ports.

AMMONIA LIQUID 880°.—In steady demand. Unchanged at 2½d. to 3d. per lb. delivered, according to quantities.

AMMONIA MURIATE.—Grey galvanizer's crystals of English manufacture quoted at about £29 per ton, ex store. Offered from the Continent at £25 10s. per ton, c.i.f. U.K. ports. Fine white crystals of continental manufacture quoted £20 5s. per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Spot material on offer at £27 per ton, ex store, quoted £25 10s. per ton, ex wharf, prompt shipment from works.

BARIUM CHLORIDE 98/100%.—English material unchanged at about £10 5s. per ton, ex store. Foreign material on offer at £8 15s. per ton c.i.f. U.K. ports.

BLEACHING POWDER.—Spot lots quoted £10 10s. per ton, ex station. Contracts 20s. per ton less.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. ports.

BORAX.—Granulated, £24 10s. per ton; crystals, £25 per ton. Powdered £26 per ton, carriage paid U.K. stations, minimum ton lots.

CALCIUM CHLORIDE.—English makers' price unchanged at £5 12s. 6d. to £5 17s. 6d. per ton, ex station. Continental quoted £3 15s. per ton c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 5s. per ton, ex works, packed in casks free.

COPPER SULPHATE.—English material unchanged at about £24 10s. per ton, f.o.b. U.K. ports. Continental quoted about £22 10s. to £23 per ton, c.i.f. U.K. ports.

FORMALDEHYDE 40%.—Spot material now quoted about £40 per ton, ex store. Offered for prompt shipment from the Continent at £39 per ton, c.i.f. U.K. ports.

GLAUBER SALTS.—White crystals of English manufacture, unchanged at £4 per ton, ex store or station. Continental on offer at about £3 5s. per ton, c.i.f. U.K. ports.

LEAD, RED.—Quoted £42 per ton, ex store, spot delivery. Offered for prompt shipment from the Continent at about £40 10s. per ton c.i.f. U.K. ports.

LEAD, WHITE.—Now quoted £44 per ton, ex store.

LEAD ACETATE.—Refined white crystals offered from the Continent at about £43 15s., c.i.f. U.K. ports. Spot material quoted £45 10s. per ton, ex store.

LEAD NITRATE.—Unchanged at about £41 per ton, ex store.

MAGNESITE GROUND CALCINED.—Unchanged at about £8 per ton, ex station, prompt delivery.

MAGNESIUM CHLORIDE.—Quotations from Continent slightly increased. Now quoted £2 17s. 6d. per ton, c.i.f. U.K. ports.

POTASH CAUSTIC 88/92%.—Unchanged at about £29 per ton, ex wharf, prompt shipment from the Continent. Spot material available at about £30 10s. per ton, ex store.

POTASSIUM BICHROMATE.—Price for home consumption 5d. per lb. delivered.

POTASSIUM CARBONATE 96/98%.—Spot material unchanged at about £25 15s. per ton, ex store. Offered for prompt shipment from the Continent at about £25 5s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE.—Spot material unchanged at about 4d. per lb. ex store. Offered for early delivery at 3½d. per lb., c.i.f. U.K. ports.

POTASSIUM NITRATE, SALTPETRE.—Refined granulated 99% quoted at about £28 per ton, ex store. Quoted £24 10s. per ton, c.i.f. U.K. ports, for prompt shipment from the Continent.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 7½d. per lb., ex store. Offered for early delivery at 7½d. per lb., ex wharf.

POTASSIUM PRUSSATE, YELLOW.—Quoted 7½d. per lb., ex store, spot delivery. Offered for prompt shipment from the Continent at a fraction less.

SODA, CAUSTIC.—76/77%, £18 per ton; 70/72%, £16 12s. 6d. per ton; broken 60%, £17 2s. 6d. per ton; powdered 98/99%, £21 7s. 6d. per ton—all carriage paid U.K. stations, spot delivery. Contracts 20s. per ton less.

SODIUM ACETATE.—On offer from the Continent at about £19 10s. per ton, c.i.f. U.K. ports. Spot material quoted £21 10s. per ton, ex store.

SODIUM BICARBONATE.—Refined recrystallised quality, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM CARBONATE.—Soda crystals, £5 to £5 5s. per ton, ex quay or station; powdered or pea quality, £1 7s. 6d. per ton more; alkali 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—English material quoted £9 15s. per ton, ex station. Continental about £8 5s. per ton, c.i.f. U.K. ports. Pea crystals of English manufacture at £14 per ton, ex station.

SODIUM NITRATE.—Ordinary quality quoted £13 7s. 6d. per ton, ex store. 96/98% refined quality 7s. 6d. per ton extra.

SODIUM NITRITE 100%.—Offered from the Continent at about £23 per ton, c.i.f. U.K. ports. Spot material available at about £24 15s. per ton, ex store.

SODIUM PRUSSATE, YELLOW.—Unchanged at about 4d. per lb., ex store, spot delivery.

SODIUM SULPHATE, SALTCAKE.—Price for Home consumption, £3 10s. per ton f.o.b. works. Good inquiry for export and higher prices obtainable.

SODIUM SULPHIDE.—English manufacturers quote 60/62% solid, £15 per ton; broken, £1 per ton more; flake, £2 per ton more; crystal 31/34%, £9 5s. per ton, carriage paid U.K. stations, minimum 4 ton lots, with slight reduction for contracts over a period; 60/62% solid offered at about £11 per ton, c.i.f. U.K. ports, from the Continent; broken, £12 per ton, c.i.f. U.K. ports; 30/32% crystals, £8 5s. per ton, c.i.f. U.K. ports.

SULPHUR.—Flowers, £9 10s. per ton; roll, £8 10s. per ton; rock, £8 7s. 6d. per ton; ground, £8 5s. per ton, ex store. Prices nominal. American crude sulphur on offer at about £5 2s. 6d. per ton, c.i.f. U.K. ports.

ZINC CHLORIDE.—97/98% of Continental manufacture quoted £23 per ton c.i.f. U.K. ports. English material for export on offer at about £25 to £26 per ton, f.o.b. U.K. port.

ZINC SULPHATE.—In moderate demand and price unchanged at about £12 10s. per ton, ex store.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

F. ACID.—Small home inquiries, 7s. per lb.

BENZALDEHYDE.—Home inquiries, 2s. 2d. per lb.

DIETHYLANILINE.—Home inquiries, 3s. 7d. per lb.

BETA NAPHTHOL.—Home inquiries, 11d. to 1s. per lb.

PARA TOLUIDINE.—Home inquiries, 3s. 2d. per lb.

Manchester Chemical Market

[FROM OUR OWN CORRESPONDENT.]

Manchester, May 8, 1925.

BUYERS of chemicals, as far as the Manchester market is concerned, have shown no disposition during the past week to come forward for any increased quantities, and business, both on home consumption account and also for shipment, continues quiet, transactions for the most part being confined to small or moderate size parcels. On the whole prices are not greatly changed from last report, but in some few instances the easy tendency noted last week is still to be observed.

Heavy Chemicals

Saltcake, while nominally unchanged at about £4 per ton, is attracting little buying interest. Glauber salts are quoted at about £3 10s. per ton, but in this case also the demand is quiet. Sodium sulphide is fairly steady at £13 15s. per ton for 60-65 per cent. concentrated solid and £9 10s. for crystals; business, however, is on a comparatively small scale. Chlorate of soda is unchanged at 2½d. per lb., and meets with a moderate demand. A quietly steady demand is being met with in the case of caustic soda, and values are firm, ranging from £15 12s. 6d. per ton for 60 per cent. material to £18 for 76-77 per cent. Prussiate of soda is steady and in fair inquiry at 3½d. to 4d. per lb. Phosphate of soda is still rather weak at about £12 15s. per ton, and only a small trade is being put through. Bleaching powder continues in quiet demand, with prices unchanged at round £9 10s. per ton. Alkali is steady and in fair request at £6 15s. per ton. Acetate of soda is easier at £19 per ton, and sales are slow. Bichromate of soda is moderately active and values are held at about 4d. per lb. Hyposulphite of soda is quiet and easy at £13 10s. per ton for photographic crystals and £9 5s. per ton for commercial quality. Soda crystals keep steady and meet with a fair demand at £5 5s. per ton. Bicarbonate of soda is unchanged either in position or values, current quotations averaging £10 10s. per ton.

Only a moderate amount of business has been done either in caustic potash or carbonate of potash, but there has been little change in values, caustic being quoted at £29 to £30 per ton and carbonate at £24 10s. to £25. Prussiate of soda is rather quiet, but values have held at about 7d. per lb. Chlorate of potash is firm and meets with a fair demand, up to 3½d. per lb. is now being quoted. Bichromate of potash is quiet but steady at 5d. per lb. Permanganate of potash is selling rather slowly, but values are unchanged from last report, commercial is quoted at about 6½d. per lb. and B.P. quality at 7½d. Sulphate of copper is easier round £24 5s. per ton, f.o.b., and demand is comparatively slow. Arsenic continues to be an extremely dull section, but values, although weak, are little changed from last report, white powdered, Cornish makes, offering at about £28 per ton in Manchester. Commercial Epsom salts are fairly steady at £4 10s. to £4 12s. 6d. per ton; magnesium sulphate, pharmaceutical quality, is quoted at about £6. Nitrate of lead is quiet at £41 per ton. Acetate of lead is in small demand at £45 per ton for white and £40 to £41 per ton for brown. Acetate of lime is on offer at £14 10s. to £15 per ton for grey material and £9 10s. for brown.

Acid and Coal Tar Products

Acetic acid is in moderate request at £39 to £40 per ton for 80 per cent. commercial and £67 for glacial. Oxalic acid is quiet but about unchanged at 3½d. per lb. Tartaric acid is fairly steady at 11½d. to 1s. per lb. Citric acid is still offering at 1s. 4d. to 1s. 4½d. per lb.

Pitch is still a slow section at about 41s. per ton. Carbolic acid is attracting very small attention; crystals are nominally unchanged at about 5d. per lb. and crude at 1s. 7d. per gallon. Solvent naphtha is in limited demand at about 1s. 5d. per gallon. Creosote oil is quiet but about unchanged at 6½d. per gallon. Naphthalenes are easy at £14 10s. per ton for refined and from £4 5s. for crude qualities.

Chemists' Exhibition

THE Chemists' Exhibition organised by *The British and Colonial Druggist* opened in Holland Park Hall on Monday. The question of works transport was dealt with, runways and speedy conveyors were exhibited, and a stand of importance was devoted to filling and canning plant. Machinery was shown capable of filling with economy anything from a full sized barrel to a minute sample container. Sealing solutions were not neglected, and L. Oertling, Ltd., showed the latest balances.

Tariff Changes

BULGARIA.—The prohibition of the importation of the following articles is withdrawn, as from December 30, 1924:—Glass, horn, bone, celluloid, when such articles are for use in chemical laboratories, chemists' or druggists' shops or hospitals; water-glass, imported by laboratories, chemists' shops, druggists and hospitals for medicinal purposes, glass tubes for physical cabinets for obtaining electric current, polished; photographic plates.

FRANCE.—The following are new classifications under the French Customs Tariff:—Nicotinic acid and its derivatives: as unspecified chemical products (No. 0381). Unvulcanised rubber in creped sheets, of uniform thickness, but not cut with a view to being used for a special purpose: as rubber (No. 119). Waste, droppings or parings of hardened casein (fit for remelting): as parings of hardened casein destined for remelting (No. 0376); (not fit for remelting): as other organic manures (No. 39). Disinfectant principally based on soap and formol, made up medicinally: as unspecified compound medicines; other: as unspecified chemical products (No. 0381). Disinfectant based on soap, coal oil and water: as soaps other than scented (No. 312). Synthetic nitrate of ammonia, with more than 1 per cent. impurities: as other ammoniacal salts, crude (No. 021); with 1 per cent. or less impurities: as other ammoniacal salts, refined (No. 022). Separators and centrifugal clarifying separators for oil, etc.: as unspecified apparatus (No. 525 sex).

PANAMA.—A new tariff provides that the general rate of import duty be fixed at 15 per cent. *ad valorem*, but some goods (including crude oil and coal for fuel, and raw materials for soap and candle making) are free of duty, and specific duties are fixed in respect of certain other goods, including salt, sugar, common soap, petroleum, cement, cottonseed oil, etc. There is also a short list of export duties.

UNITED STATES OF AMERICA.—The following decisions have been reached by the Board of General Appraisers respecting the application of the United States Tariff Act of 1922:—

Articles.	Paragraph under which dutiable.	Rate of Duty.
Varnish and oil containing mercury.—Varnish containing mercury and treated oil containing mercury, which articles are used in the manufacture of composition paints for marine work, resisting the effect of salt water and corrosion, are not "other mercurial preparations" within the meaning of paragraph 17 of the Tariff, but are properly classifiable under paragraph 58 as "combinations and mixtures of animal, vegetable or mineral oils" [T.D. 40435] ...	58	25% <i>ad valorem</i>
Aluminium bronze powder is properly dutiable as bronze powder rather than as aluminium powder [T.D. 40458]	382	14 cts. per pound

AUSTRALIA.—Lists of the articles now listed for the new preference conditions for imports from Great Britain are printed in the *Board of Trade Journal* for April 30.

IRAQ.—The following are revised Customs duties with effect from March 19, 1925: Saccharin and other concentrated sugar substitutes, 2 annas per gramme; artificial manures, free.

Pulverised Fuel Possibilities

THE final general meeting of the Yorkshire Branch of the Institution of Mechanical Engineers was held on Friday, May 1, at Leeds, when Mr. David Wilson read a paper on "Pulverised Fuel and its Relation to Modern Power Plant Design."

The author mentioned the great combustion efficiency of powdered fuel, the lowness of grade which could thus be burnt, and the flexibility of the system. Figures of 90 and 91 per cent. test efficiency were given, and high guarantees over long periods in every-day operation. Pulverised fuel plants were capable of larger evaporative capacities and plants so fired were claimed to be smokeless and dustless. Figures from America showed low labour and maintenance costs. The Murray water-cooled furnace walls and the Lopulco water screen were tending to a complete alteration in our theories of boiler and furnace design.

Company News

LIVERPOOL NITRATE CO.—An interim dividend of 1s. 6d. per share, less tax, has been declared, payable on May 26.

SANTA CATALINA NITRATE CO.—The directors have declared an interim dividend of 5 per cent., less tax, payable on June 22.

CHLORIDE ELECTRICAL STORAGE CO.—A dividend of 10 per cent. (actual) and a bonus of 2s. per share are announced, both tax free.

ANGELA NITRATE CO., LTD.—The directors have decided to recommend a final dividend of 15 per cent., less tax, making a total of 25 per cent. for the year 1924.

"SANITAS" CO.—A final dividend of $4\frac{1}{2}$ per cent., making 9 per cent. per annum on the 9 per cent cumulative preference shares, has been declared, payable on June 2.

PARIPAN, LTD.—The directors propose that the capital of the company be written down from £100,000 to £25,000 by reducing each £1 share to the nominal value of 5s.

JURGENS MARGARINE WORKS.—At the annual meeting on Monday the dividend on the ordinary shares was discussed, and, contrary to the annual report, the board finally agreed to consider the payment of a 6 per cent. dividend.

ALLEN-LIVERSIDGE, LTD.—A dividend at the rate of $6\frac{1}{2}$ per cent. per annum, less tax, on the preference shares, calculated from the respective dates of payments of instalments up to April 30, 1925, has been declared.

DUBARRY PERFUMERY CO.—The accounts show a profit for the year of £42,571. A final dividend of 45 per cent., less tax, is recommended on the ordinary shares, making 60 per cent. for the year. The reserve account is increased to £20,000, and £5,860 carried forward.

ZINC CORPORATION, LTD.—A final dividend for 1924 of 3s. per share is recommended on the preference and ordinary shares (making 5s. for the year), payable, less tax, on June 23. The directors have also declared a dividend of 2s. per share on the preference shares in respect of 1925.

BEDDE METAL AND CHEMICAL CO.—The report for 1924 states that operations resulted in a loss of £14,046, and the debit balance brought forward, after payment of directors' fees for 1923, was £31,775, leaving at debit of profit and loss £45,821. The directors regret loss, which they state is in great part due to continuance of adverse trade conditions prevailing during the year. Sales of refined copper were only about one-third of the capacity of the smelting works, which, in consequence, were closed down during part of the year. Position at the mine in Norway has improved. Production of pyrites has necessarily been below the normal output capacity, but the orders obtained have resulted in a profit for the year, after allowing for depreciation. Further contracts have been secured from British and foreign customers and the outlook at the mine is altogether more satisfactory. The annual meeting will be held at Newcastle-upon-Tyne on May 13 at 12 noon.

DOMINION TAR AND CHEMICAL CO.—The net profit for the year 1924, after having carried £20,208 to depreciation account, is £39,688. The directors propose to pay a final dividend of 5 per cent., free of tax, making 10 per cent., free of tax, for the year, leaving to be carried forward £2,688. The report states that the result of trading has been satisfactory, in view of general decline in market prices and falling off in the supply of raw material owing to depressed condition of the steel trade in Canada. Heavy expenditure was incurred of the new works at Toronto and Duluth, which are now in operation, and a beginning was made with the construction of the new plant at Winnipeg. Operations of the Canada Creosoting Co., Ltd., during 1924 gave satisfactory results, enabling it to declare an increased dividend, namely, \$1.50, plus bonus of 25c. per share on an increased capital, against \$1.50 per share declared for the year 1923. The profits of the Alexander Murray and Co., Ltd., in spite of very severe competition, have also shown an increase on the previous twelve months, enabling it to declare a dividend of 10 per cent. This company, in order further to consolidate its position and provide for its extensions, has again had to increase its capital. During 1924, owing to new enterprises undertaken by all three companies, the capital of the Dominion Tar and Chemical Co. was increased by 50,000 ordinary shares of £1 each and 200,000 7 per cent. cumulative preference shares of £1 each.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us by Mr. H. T. P. Gee, Patent and Trade Mark Agent, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to May 29, 1925.

"OSTELINE."

457,171. For chemical substances prepared for use in medicine and pharmacy. Joseph Nathan and Co., Ltd., 16, St. Helen's Place, London, E.C.3, merchants. March 14, 1925. (To be Associated. Sect. 24.)

"MULTAR."

455,579. For raw, or partly prepared, vegetable, animal and mineral substances used in manufactures, not included in other classes, but not including carbons for electrical purposes and not including any goods of a like kind to such excluded goods, Class 4. Amoa Chemical Co., 9, Marvels Parade, Marvels Lane, Grove Park, Lee, London, S.E.12, chemical manufacturers. January 23, 1925.

Opposition to the Registration of the following Trade Marks can be lodged up to June 6, 1925.

"PRENOL."

454,781. For chemical substances used in manufactures, photography or philosophical research, and anti-corrosives, but not including photographic developers and not including any goods of a like kind to photographic developers. Class 1. Mirifique, Ltd., Thalia Works, Grosvenor Road, Hanwell, Middlesex, manufacturers of paints and varnishes. December 23, 1924.

"SNOWDRIFT."

455,616. For chemical substances used in manufactures, photography or philosophical research, and anti-corrosives, but not including paints, colours, size or adhesives, and not including any goods of a like kind to any of these excluded goods. Class 1. Joseph Watson and Sons, Ltd., Whitehall Soap Works, Whitehall Road, Leeds, manufacturers. January 23, 1925. (To be Associated. Sect. 24.)

"PHANODORM."

456,641. For chemical substances prepared for use in medicine and pharmacy. Bayer Products, Ltd., 31 to 34, Basinghall Street, London, E.C.2; merchants and manufacturers. February 26, 1925.

"PETROHOL."

457,023. For chemical substances prepared for use in medicine and pharmacy. Class 3. Standard Oil Co. (a corporation organised and existing under the laws of the State of New Jersey), Constable Hook, Bayonne, Hudson County, New Jersey, United States of America; refiners of oils, manufacturers and merchants. March 10, 1925. (To be Associated. Sect. 24.)

"CELRESIST."

456,697. For dyes. Class 4. The Geigy Colour Co., Ltd., 35 and 37, Dickinson Street, Manchester; dyestuff manufacturers. February 27, 1925.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

CHEMICALS, ETC.—A Paris engineer desires to represent British firms in the iron, steel and chemical industries. (Reference No. 516.)

MECHANICAL SAND FILTERS.—The Ministry of the Interior at Cairo are inviting tenders for the supply and installation of three mechanical sand filters, of the gravitation type. British firms in a position to offer British materials can obtain further particulars, quoting Reference No. A.X. 1971.

COKE, SALT CAKE.—A commission agent in Copenhagen desires to obtain the representation for Denmark of British exporters of coke and salt-cake. (Reference No. 547.)

OIL SEEDS.—An agent in Genoa desires to represent British exporters of oil seeds. Correspondence in English. (Reference No. 552.)

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry make no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

NATIONAL PETROLEUM CO., Abbey House, Westminster, manufacturers. (C.C., 9/5/25.) £13 8s. 8d. March 27.

Mortgages and Charges

[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]

GREENWOOD'S (CHEMISTS), LTD., Manchester. (M., 9/5/25.) Registered April 27, £200 debentures part of £2,000; general charge.

Satisfaction

PEPTINE MALTINE, LTD. (late CHARLES HOWES AND CO., LTD.), Thurmaston. (M.S., 9/5/25.) Satisfaction registered April 24, £600, registered July 24, 1912.

Receivership

SHARDLOW CHEMICAL CO., LTD. (R., 9/5/25.) S. Blythen, of Victoria Chambers, Long Eaton, was appointed Receiver and Manager on April 28, 1925, under powers contained in first mortgage debenture dated November 5, 1923.

London Gazette

Winding Up Petitions

OPHIR SYNDICATE, LTD. (W.U.P., 9/5/25.) A petition for winding-up has been presented by the Isis Chemicals and Dyes, Ltd., St. George's Chambers, Athol Street, Douglas, Isle of Man, and is to be heard at the Royal Courts of Justice, Strand, London, May 19.

OVERSEA COMPOSITION AND PAINT CO., LTD. (W.U.P., 9/5/25.) A petition for winding up has been presented, and is to be heard at the Royal Courts of Justice, Strand, London, on Tuesday, May 19.

Company Winding Up

SHARDLOW CHEMICAL CO., LTD. (C.W.U., 9/5/25.) Winding up order, April 30.

Company Winding Up Voluntarily

GLASGOW VARNISH AND PAINT CO., LTD. (C.W.U.V., 9/5/25.) By Special Resolution April 14, confirmed May 1, James Gillies, Chartered Accountant, Glasgow, appointed Liquidator. Meeting of the creditors at 133, St. Vincent Street, Glasgow, on Wednesday, May 20, at 12 noon.

New Companies Registered

BEETLE PRODUCTS CO., LTD., 49, Queen Victoria Street, London, E.C.4. To adopt an agreement with the British Cyanides Co., Ltd., and to carry on the business of manufacturers, importers, and exporters of and dealers in chemicals of all kinds, synthetic syrups, resins, varnishes, paints, pulp, paper, wood, asbestos, China clay, etc.; druggists, engineers, founders, metallurgists, drysalts, oil and colourmen, etc. Nominal capital, £35,000 in 30,000

7 per cent. cumulative preference shares of £1 each and 100,000 ordinary shares of 1s. each.

BILLOWZONE, LTD. Manufacturing, wholesale and retail chemists, etc. Nominal capital, £20,000 in £1 shares. Solicitor: C. S. Tomlinson, 161, New Bond Street, London.

KEK, LTD., Imperial House, Kingsway, London. To carry on in the United Kingdom and abroad the business of manufacturing and selling grinding machines of the intercalating pin mill type, known as the Kek mill. Nominal capital, £100 in £1 shares.

NEW FOUNDLAND OILFIELDS, LTD., 40-42, Broad Street Avenue, London, E.C. To acquire any naphtha or oil bearing land or property in any part of the world; to deal in naphtha, petroleum, ozokerite, bitumen, asphalt, mineral or other oils, etc. Nominal capital, £1,000 in 2s. shares.

RATCLIFFE (BRADFORD), LTD., 36, Aldermanbury, Bradford. Oil, paint and chemical manufacturer and merchant. Nominal capital, £2,000 in £1 shares.

REALM COMPANY (GLASGOW), LTD., 4, Falfield Street, Port Eglinton, Glasgow. Soap manufacturers; manufacturers, preparers and dealers in all kinds of oil and oleaginous and saponaceous substances; manufacturing and general chemists and druggists, etc. Nominal capital, £1,000 in £1 shares.

JOHN TIMPSON AND CO., LTD., 106, Golden Lane, London, E.C.1. Manufacturing, wholesale, retail, consulting and analytical chemists and druggists, etc. Nominal capital, £3,000 in £1 shares.

WASTE OIL REFINERS, LTD, clarifiers and treaters of waste and other oils, etc. Nominal capital, £10,000, in £1 shares. Solicitors: Cooper, Bake, Fettes, Roche and Wade, 6-7, Portman Street, Portman Square, London.

Chemical Inventors' Expenses

Government Attitude Criticised

MR. JUSTICE TOMLIN, presiding at a sitting of the Royal Commission on Awards to Inventors at the Law Courts on Monday, criticised the Government's attitude towards expenses incurred by scientific investigators who had done work at the request of Government departments. The case under consideration was the claim of Dr. W. B. Davidson in respect of processes for extracting toluol from coal gas.

The Chairman pointed out that the claimant had converted a garage into a laboratory for the purpose of making experiments, and in that connection had claimed only £50. He claimed an award, but if he failed before the Commission, why in the world should the Government not pay his expenses?

Mr. Tyrrell, who appeared for the Crown, said that if expenses of that nature resulted in an invention the expenses should have been claimed at the time from the department concerned.

The Chairman.—Of course, in a way they should have been paid then, but it seems to me that it is the business of the Government to see that they pay the people who do work for them. It seems to me unfair that if a man has been out of pocket substantially in doing work of this kind, he should not have been paid for it.

Mr. Justice Tomlin added:—"Even though his suggestion may not reach such a mark of inventiveness as to justify an award, he did the work at the request of the Government and should be paid."

Mr. Tyrrell.—With respect, is that a matter for this Commission?

The Judge.—No, that is why I am complaining. If it were, I should not be talking to you about it now. The view I am expressing is that in this sort of case the Government ought to say they will pay, because we cannot recommend it. If we come to the conclusion that he is not entitled to an award it would seem that he will get nothing.

After consulting some officials, Mr. Tyrrell said he was definitely instructed that the War Office would consider any application in respect of out-of-pocket expenses which was put forward.

The Chairman.—That is very proper. Whatever is the result of this application, the Government should at least give what I might call benevolent consideration to a matter of this kind.

